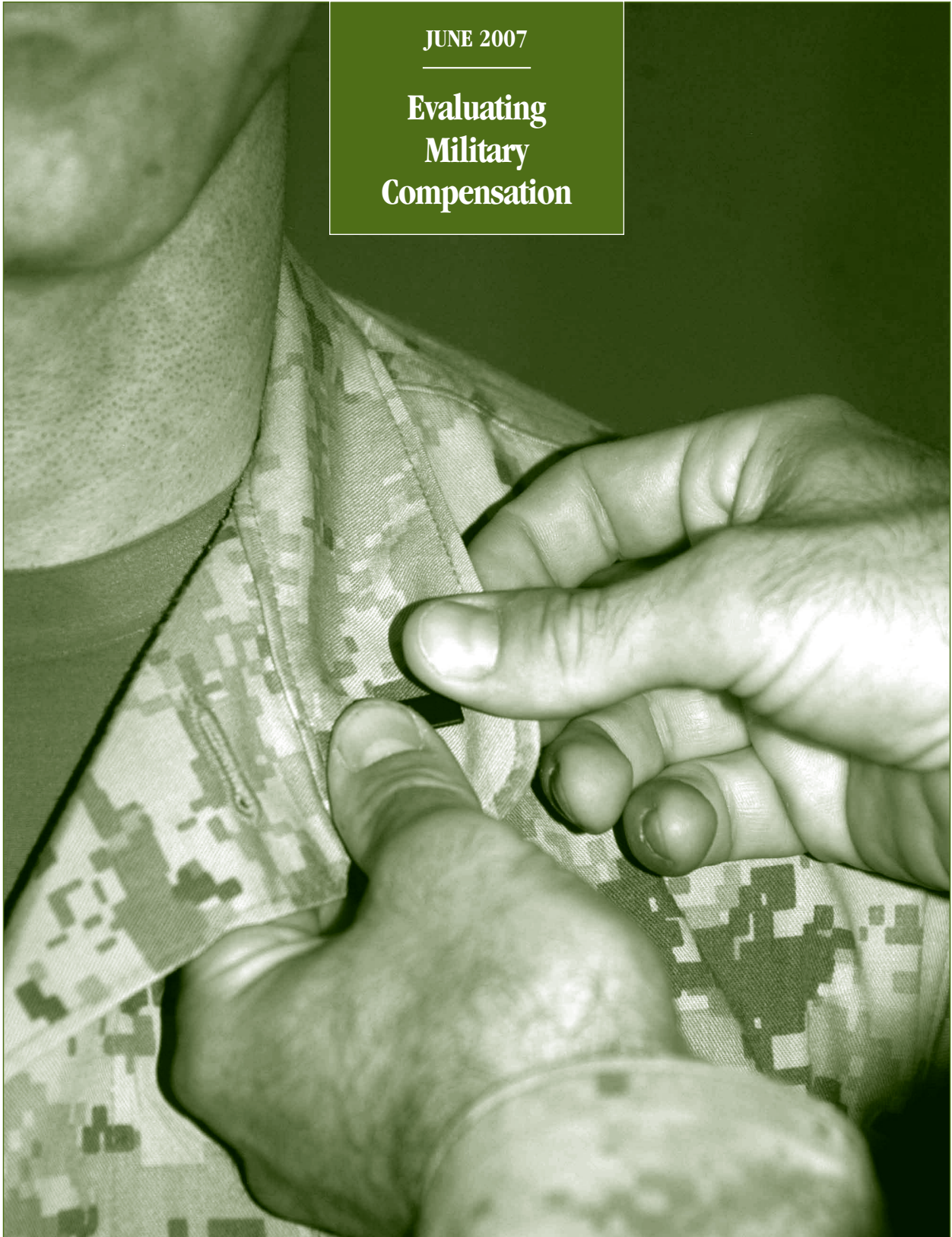


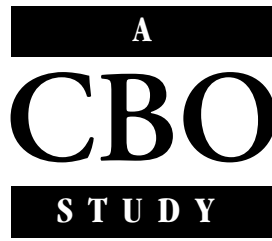
CONGRESS OF THE UNITED STATES
CONGRESSIONAL BUDGET OFFICE

A
CBO
STUDY

JUNE 2007

Evaluating
Military
Compensation





Evaluating Military Compensation

June 2007

Notes

Unless otherwise indicated, the years referred to in this study are calendar years.

Numbers in the text and tables may not add up to totals because of rounding.

The cover photograph shows a Marine Corps officer receiving the first lieutenant rank insignia during a promotion ceremony in Ar Ramadi, Iraq. The photograph was taken by Cpl. Tom Sloan and was provided courtesy of the U.S. Marine Corps.



Preface

One factor that affects whether people join or remain in the military is how the compensation they expect to receive compares with that of civilian jobs. To recruit and retain members of the armed forces, the Department of Defense (DoD) must offer a pay package that is competitive with opportunities in the civilian sector and that adequately compensates personnel for the difficulties of serving in the military. In the late 1990s, lawmakers and DoD began making a concerted effort to increase cash and noncash elements of military compensation, in part because of declining retention among service members.

This Congressional Budget Office (CBO) study—prepared at the request of the Ranking Member of the Senate Budget Committee—offers an overview of military compensation, particularly that of active-duty enlisted personnel. It considers various ways to measure military compensation and to compare military and civilian pay, as well as issues raised by such comparisons. The study also examines the connection between the components of military compensation and DoD’s recruiting and retention. Finally, it discusses options to make military compensation more efficient. In keeping with CBO’s mandate to provide objective, impartial analysis, this study makes no recommendations.

Carla Tighe Murray of CBO’s National Security Division wrote the study under the general supervision of Matthew S. Goldberg and J. Michael Gilmore. Victoria Liu, Allison Percy, Matthew Schmit, and Jason Wheelock contributed to the analysis. Nabeel Alsalam provided data on civilian workers, and Cary Elliott provided data on federal civilian employees. Thomas DeLeire, Robert Dennis, Arlene Holen, Sarah Jennings, and Donald Marron offered helpful comments, as did John Enns of the Naval Postgraduate School. (The assistance of an outside reviewer implies no responsibility for the final product, which rests solely with CBO.)

Christian Howlett edited the manuscript, and Christine Bogusz proofread it. Cindy Cleveland produced drafts of the manuscript and the tables. Maureen Costantino prepared the report for publication and designed the cover. Lenny Skutnik printed the initial copies, Linda Schimmel coordinated the print distribution, and Simone Thomas prepared the electronic version for CBO’s Web site (www.cbo.gov).



Peter R. Orszag
Director

June 2007

Report Documentation Page			Form Approved OMB No. 0704-0188		
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE JUN 2007		2. REPORT TYPE		3. DATES COVERED 00-00-2007 to 00-00-2007	
4. TITLE AND SUBTITLE A CBO Study. Evaluating Military Compensation			5a. CONTRACT NUMBER		
			5b. GRANT NUMBER		
			5c. PROGRAM ELEMENT NUMBER		
6. AUTHOR(S)			5d. PROJECT NUMBER		
			5e. TASK NUMBER		
			5f. WORK UNIT NUMBER		
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Congressional Budget Office,Ford House Office Building, 4th Floor,Second and D Streets, SW,Washington,DC,20515-6925			8. PERFORMING ORGANIZATION REPORT NUMBER		
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)			10. SPONSOR/MONITOR'S ACRONYM(S)		
			11. SPONSOR/MONITOR'S REPORT NUMBER(S)		
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES http://www.cbo.gov/ftpdocs/82xx/doc8271/06-29-Compensation.pdf					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 44	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			



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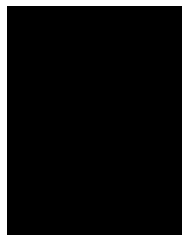
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Evaluating Military Compensation

Introduction and Summary

To attract and retain the military personnel it needs, the Department of Defense (DoD) must offer a competitive compensation package—one that adequately rewards service members for the rigors of military life. After reenlistment rates declined in the late 1990s, lawmakers and DoD began increasing cash and noncash elements of military compensation. In 2000, for example, they authorized that basic pay for service members would rise 0.5 percentage points faster than wages in the civilian sector through 2006.¹ Housing allowances and other compensation were also increased. As a result, the Congressional Budget Office (CBO) estimates, regular military compensation adjusted for inflation—basic pay, allowances for food and housing, and the tax advantage that arises because those allowances are not subject to federal income tax—grew by 21 percent for the active-duty enlisted force as a whole between 2000 and 2006.

This study looks at compensation for the 83 percent of active-duty U.S. service members who are enlisted personnel. It considers various ways to measure military compensation and examines common methods of—and problems with—comparing that compensation with pay and benefits in the civilian sector. The analysis also explores the connection between the components of military compensation and the military's recruiting and retention of personnel. Finally, the study discusses possible options to make the military compensation system visible to service members and decisionmakers and more efficient.

Defining Military Compensation

Compensation in the U.S. military can be measured in several ways. The first, and perhaps most common, definition consists of the basic pay, housing and subsistence allowances, and associated tax advantages to which each service member is entitled. DoD has used that regular military compensation (RMC) as a fundamental measure of military pay since at least 1962.²

A second, more complete, measure of military compensation includes noncash and deferred cash benefits—such as health care for current service members and their families, the health care and other veterans' benefits that members can receive once they leave the military, and retirement pay and health benefits for members who serve for at least 20 years or become seriously disabled. Military personnel and their families are also eligible for subsidized child care and groceries, the use of physical fitness and recreational facilities, free legal and financial counseling, and other family-support programs.

Third, even within the confines of purely cash compensation, service members can receive special pays, bonuses, and allowances that are not counted in RMC. Special and incentive pays are usually awarded for particular skills or for hazardous duty, including deployment and combat. Members may also earn bonus payments when they reenlist for several more years, especially if they have occupational skills that are in short supply. There are more than 60 types of special pays and bonuses, but an individual member might receive only a few over the course of his or her career. In 2006, special pays for enlisted personnel ranged from \$50 to \$1,000 per month, and one-time lump-sum bonuses reached as high as \$150,000. Because all of those types of pay are either earned by relatively few

1. The version of the National Defense Authorization Act for Fiscal Year 2008 passed by the House of Representatives on May 17, 2007 (H.R. 1585) would restore the practice of granting basic-pay raises at that rate (0.5 percentage points above the employment cost index) for 2009 through 2012.

2. Department of Defense, Under Secretary of Defense for Personnel and Readiness, *Report of the 9th Quadrennial Review of Military Compensation*, vol. 1 (March 2002), p. 29.

specialists or are earned irregularly, they are not generally included in the RMC measure. Nevertheless, measures that assessed pay between different occupational specialties in the military would include such special and incentive pays and bonuses as well as regular military compensation.

This study estimates compensation for enlisted personnel using the three definitions described above. Each measure of compensation provides insights into some policy matters but is less useful in addressing others. For example, a measure that includes all noncash and deferred benefits can give a broader picture of the cost of the military's entire compensation package. But because it combines funds appropriated to different agencies and departments, that measure may be less helpful in assessing a particular agency's budget.

Comparing Military and Civilian Compensation

To determine whether the military's compensation package is competitive, policymakers try to compare it with civilian compensation. This study looks at four ways of comparing military and civilian pay, each of which illuminates different issues. Estimates made using each of the four methods suggest that, as of 2006, military compensation compared favorably with civilian compensation.

- One method compares the cumulative increases over time in private-sector wages and salaries and in military basic pay. Many of those comparisons begin in 1982 because lawmakers authorized relatively large pay increases for service members between 1980 and 1982 to promote pay "equality" between the military and civilian sectors. Such simple "pay gap" calculations suggest that the total rise in basic pay between 1982 and 2006 is less than the cumulative increase in private-sector wages. That simple approach has shortcomings, however, including the use of a relatively narrow measure of cash compensation (basic pay). Cumulative increases in broader measures of military cash pay, such as regular military compensation, exceed the private-sector increase, CBO estimates.
- A second method compares levels of military and civilian pay, adjusted for people's years of experience and education. On the basis of the findings of the 9th Quadrennial Review of Military Compensation, DoD has requested enough funding since 2001 to raise RMC for enlisted personnel to be comparable with the 70th percentile of earnings for civilian men of sim-

ilar ages, education, and experience. In 2006, regular military compensation generally exceeded that 70th percentile benchmark, CBO estimates. RMC for enlisted personnel also compared favorably with the earnings of male federal white-collar employees of comparable ages, education, and experience.

- A third method compares total compensation, including noncash and deferred cash benefits. Data suggest that military personnel receive about 50 percent of their total compensation in such benefits, compared with about 33 percent for civilian workers. Thus, adding noncash benefits to cash compensation makes the military package substantially larger than comparable civilian packages.
- A fourth method compares military and civilian trends in cash compensation—including special pays and bonuses—for selected occupations. With special pays and bonuses factored in, and adjusting for inflation, average cash pay for enlisted personnel in the Army has grown by 38 percent since 1999. However, because RMC forms the bulk of cash compensation and does not vary by occupation, the military has limited ability to resolve occupational shortages or surpluses by altering pay.

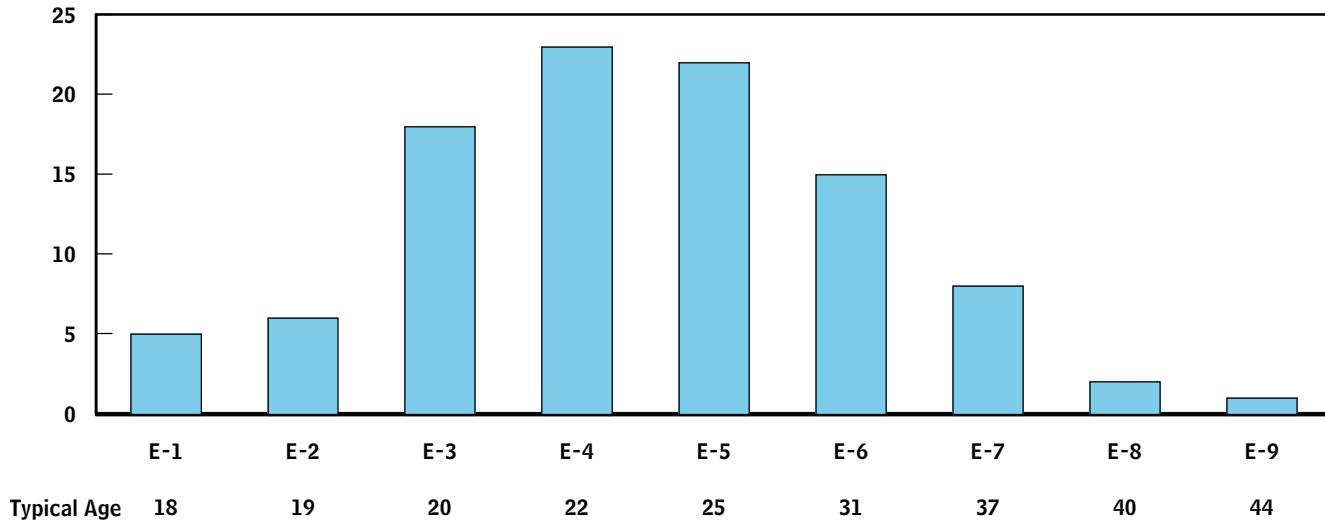
Factors That Complicate Military–Civilian Comparisons

Comparing compensation in the military and civilian sectors can be problematic. One obvious limitation is that such comparisons cannot easily account for different job characteristics. Many military jobs are more hazardous, require frequent moves, and are less flexible than civilian jobs in the same field. Members of the armed forces are subject to military discipline, are considered to be on duty at all times, and are unable to resign, change jobs at will, or negotiate pay. Military personnel also receive extensive training, paid for by the government. Family-support programs are generally more available in the military, compared with civilian employers. Intangible rewards, such as a shared sense of purpose, may be higher among military personnel as well. Quantifying those elements among military and civilian employers is extremely difficult.

In the view of some researchers, policymakers, and service members, the features that are unique to military life require a compensation package that is distinctly different from civilian systems. For example, pay based on rank

Figure 1.**Distribution of Active-Duty Enlisted Personnel, by Pay Grade, 2006**

(Percent)



Source: Congressional Budget Office based on data from the Department of Defense.

Note: These numbers are for total active-duty enlisted personnel in all of the military services.

and longevity may be necessary to promote good order and discipline in a way not required in civilian jobs. A package favoring noncash compensation may promote military readiness, some observers would argue, by developing or strengthening the well-being of service members and their families. Noncash benefits such as subsidized, accredited child care or family health care help to provide a high quality of life for young service members. The availability of similar goods and services at all military bases—even those in remote locations, where markets are limited—reduces the search costs that frequent moves impose on military families.

Other observers, including some service members, view the military's traditional pay system as standing in the way of an efficient or cost-effective all-volunteer force. They argue that a greater emphasis on cash compensation—which would allow service members to choose the goods and services that they valued most—would enable DoD to maintain a larger and more capable force for the same total cost as the present force. Those observers note that today's military increasingly emphasizes a more expeditionary force, so families are less likely to accompany a deployed service member. In addition, two-thirds of active-duty members and all reservists live off-base, so on-base communities may not serve those members as effec-

tively as a more cash-based system would. Also, cash can be more easily targeted toward those personnel who are most productive or who possess the skills that the military wants to retain.

Military Pay, Promotions, and Rank

All service members on active duty receive regular military compensation, about 60 percent of which is basic pay. Levels of basic pay, which are spelled out in the basic-pay table, depend on rank and years of service. The lowest pay grade is E-1, for people holding the rank of private in the Army or Marine Corps, seaman recruit in the Navy, or airman basic in the Air Force. The highest enlisted pay grade is E-9, which includes the ranks of sergeant major or command sergeant major in the Army, sergeant major or master gunnery sergeant in the Marine Corps, master chief petty officer in the Navy, and chief master sergeant in the Air Force. In 2006, most of the enlisted force was in pay grades between E-3 (a private first class in the Army, for example) and E-6 (an Army staff sergeant, for instance), as shown in Figure 1. Typical ages for those grades range from 20 to 31 years. (Most enlisted personnel join the military shortly after graduating from high school.) Service members earn increases in

their basic pay by being promoted, completing additional years of service, or both.

Other types of military compensation—including housing allowances, retirement pay, and certain noncash benefits—also vary with rank. For example, a member’s military rank (along with family size) will determine the size and type of on-base family housing unit that he or she may receive. Because rank plays an important role in military compensation, good performance can be rewarded with frequent promotions. Under the “up or out” system, however, personnel who are not promoted to successive ranks within set periods of time generally must leave military service.

An important type of deferred military compensation is retirement pay, the immediate lifetime annuity that service members receive after serving for at least 20 years on active duty.³ Each year, the federal government deposits an amount in the Military Retirement Fund equal to the accruing liability of future retirement pay. In fiscal year 2006, DoD contributed about \$14 billion to the fund, with the Treasury contributing another \$2.3 billion—a total amount equal to about \$10,000 per service member.⁴

The largest component of the military’s noncash compensation is health care. In fiscal year 2006, the government spent—or accrued liabilities of—about \$37 billion for current and future health benefits for today’s active-duty personnel and their families.⁵ Of that amount, about \$13 billion funded the current care of active-duty service members and their dependents. The government accrued liabilities of roughly \$14 billion to pay for the projected

medical expenses of future retirees and their dependents. Service members who leave active duty and become veterans are also eligible for health care provided by the Department of Veterans Affairs (VA), which could cost about \$10 billion annually if it were funded on an accrual basis.⁶

Veterans’ benefits also include the education programs of the Montgomery GI Bill, disability compensation, and home loans, as well as other programs administered by the VA. Those benefits could cost almost \$12 billion in fiscal year 2006 on an accrual basis.⁷ VA health care and benefits are available to military personnel who leave the service in good standing.⁸

Estimates of Military Compensation

Which elements should be included in calculations of military compensation and which should be omitted depends on the question being studied. Since 2000, several major studies have measured how much the government spends on compensation per service member, with each study using a different combination of pay and benefits (see Table 1).

- The 9th Quadrennial Review of Military Compensation estimated total military compensation in fiscal year 2000 at \$109.5 billion—or an average of about \$90,200 per active-duty member (enlisted or officer) in 2005 dollars.⁹ That study focused on DoD-related costs, so many veterans’ benefits were excluded. It also omitted some noncash elements of compensation, such as commissaries and child care.

3. Military personnel who become disabled while on active duty may receive a disability retirement pension even if they served for fewer than 20 years. About 3 percent of the personnel who retired in fiscal year 2005 did so under those conditions. See Department of Defense, Office of the Actuary, *Fiscal Year 2005 DoD Statistical Report on the Military Retirement System* (2006), pp. 84 and 88, available at www.defenselink.mil/actuary/statbook05.pdf.

4. Those figures come from DoD’s budget for fiscal year 2007, the Office of the Under Secretary of Defense (Comptroller), and *Budget of the United States Government, Fiscal Year 2008: Appendix*, p. 229.

5. That estimate does not include the costs of providing health care to current retirees and veterans or to inactive guard and reserve personnel.

6. Accrual estimates of veterans’ benefits are based on data from Government Accountability Office, *Military Personnel: DoD Needs to Improve the Transparency and Reassess the Reasonableness, Appropriateness, Affordability, and Sustainability of Its Military Compensation System*, GAO-05-798 (July 2005).

7. That figure does not include the tax advantages that arise from the fact that veterans’ benefits are not taxable.

8. Eligibility for most veterans’ benefits is based on discharge from active military service under conditions other than dishonorable ones after a minimum period of service specified by law. Eligibility for selected benefits requires meeting additional criteria.

9. Department of Defense, *Report of the 9th Quadrennial Review of Military Compensation*. CBO inflated all of the estimates from these five studies to 2005 dollars using the consumer price index.

Table 1.**Summary of Five Recent Studies of Military Compensation**

	9th Quadrennial Review of Military Compensation (2002)	CBO (2004)	Center for Naval Analyses (2004)	Government Accountability Office (2005)	Department of Defense (Unpublished, 2005)
Estimated Average Compensation per Service Member (2005 dollars) ^a	90,200	107,600	94,900	115,500	138,000
Fiscal Year Analyzed	2000	2002	2002	2004	2005
Personnel Included in Study	Officers/Enlisted	Officers/Enlisted	Navy	Officers/Enlisted	Officers/Enlisted
Types of Compensation Included in Study					
Basic pay	x	x	x	x	x
Basic allowances for housing and subsistence	x	x	x	x	x
Federal tax advantage ^b	x	x	x	x	x
Special pays	x	x	x	x	x
Child care		x		x	x
Health care	x	x	x	x	x
Commissaries		x		x	x
In-kind food		x		x	x
Bachelor housing		x		x	x
Family housing	Privatized only	x	Privatized only	x	x
Retirement benefits	x	x	x	x	x
Veterans' benefits	Some	x	Some	x	x
Schools and Impact Aid ^c		x		x	x
Recruiting bonuses					x
Training			x		x
Travel				x	x
Management and support costs				Some	x
Estimated Percentage of Total Compensation Received in Cash	70	40	55	49	39

Source: Congressional Budget Office based on Department of Defense, Under Secretary of Defense for Personnel and Readiness, *Report of the 9th Quadrennial Review of Military Compensation*, vol. 1 (March 2002); Congressional Budget Office, *Military Compensation: Balancing Cash and Noncash Benefits* (January 16, 2004); James E. Grefer, Richard E. Miller, and David Gregory, *Comparing the Relative Value of Active Duty and Civilian Compensation Packages*, CRM D0010553.A2 (Alexandria, Va.: CNA Corporation, September 2004); Government Accountability Office, *Military Personnel: DoD Needs to Improve the Transparency and Reassess the Reasonableness, Appropriateness, Affordability, and Sustainability of Its Military Compensation System*, GAO-05-798 (July 2005); and unpublished briefing from the Department of Defense (August 26, 2005).

- Because each study used different techniques and assumptions, their estimates are not directly comparable. CBO converted the estimates to 2005 dollars using the consumer price index.
- The advantage that occurs because cash allowances for housing and subsistence (food) are not subject to federal income tax.
- Impact Aid consists of payments that the Department of Education makes to some local school districts that include land not subject to local property taxes, such as military bases and Indian lands.

- In a 2004 analysis, CBO estimated total compensation per service member at \$107,600.¹⁰ That estimate included cash and noncash benefits paid for by DoD and other government departments, but it did not include the travel or training costs of military personnel.
- A 2004 study by the Center for Naval Analyses (CNA), using methods similar but not identical to CBO's, estimated average compensation at \$94,900 for Navy personnel.¹¹
- In a 2005 report, the Government Accountability Office estimated that compensation for active-duty service members averaged \$115,500.¹² That higher figure was partly attributable to continued increases in military compensation after the CBO and CNA studies were completed.
- An unpublished DoD study from 2005, which included the costs of military training and travel as well as expenditures outside the DoD budget, estimated compensation at \$138,000 per service member in fiscal year 2005.

All of those studies used a similar approach in that they included the cost of various elements of military compensation to either DoD or the federal government. However, because the studies used different data elements as well as different techniques and assumptions, their estimates of military compensation are not directly comparable. Despite the varying approaches, all of the studies show that using basic pay to assess the adequacy of total military compensation ignores a wide range of pay and benefits received by most service members.

Total Compensation for Enlisted Personnel by Years of Experience

CBO has expanded on its 2004 analysis of average compensation for all active-duty personnel to estimate how average compensation varied in 2006 for enlisted person-

nel by their years of experience and whether they were married or single. The estimates compare compensation for a notional single enlisted member and a married enlisted member with a working spouse and two children, assuming that both members entered the military immediately after graduating from high school. The estimates cover cash compensation (RMC), noncash compensation (such as the cost of health care for service members and their families, the subsidized groceries available at commissaries, and the use of subsidized pre-school or after-school child care for the member with children), and deferred compensation (including the accrued cost of retirement pay, health care for retirees, and veterans' benefits).¹³

By that measure, a 20-year-old high school graduate with no dependents who had reached the pay grade of E-3 earned about \$33,000 in cash compensation last year, as well as \$28,000 in noncash and deferred benefits (see Table 2). A similar member in grade E-6 with 12 years of service received a total of about \$96,000 in pay and benefits, and a 40-year-old E-8 earned total compensation of about \$127,000. (Estimates of cash and noncash compensation for the median enlisted member—a 22-year-old E-4 with four years of service—are shown in Appendix A.)

Service members who have families receive more cash income as well as greater noncash benefits. Cash compensation rises when members marry or have children because housing allowances are higher for personnel with dependents.¹⁴ Adding in the benefits of health care, subsidized groceries, and child care for family members pushes total compensation for enlisted personnel with families 11 percent to 24 percent above compensation for otherwise-similar single members. Typically, that family premium is higher for younger personnel. The premium may create financial incentives for military personnel to marry earlier than their civilian counterparts, and some

10. Congressional Budget Office, *Military Compensation: Balancing Cash and Noncash Benefits* (January 16, 2004).

11. James E. Grefer, Richard E. Miller, and David Gregory, *Comparing the Relative Value of Active Duty and Civilian Compensation Packages*, CRM D0010553.A2 (Alexandria, Va.: CNA Corporation, September 2004).

12. Government Accountability Office, *Military Personnel*.

13. Noncash compensation also includes the Social Security and Medicare taxes that DoD pays on behalf of service members as well as its payments to the Unemployment Compensation for Ex-Servicemen program. Those payments are similar to civilian employers' FICA (Federal Insurance Contributions Act) and unemployment insurance contributions.

14. If two service members marry, they each receive their same "single" housing allowance. If they have children, one member receives the "with dependents" allowance and the other receives the "single" allowance.

Table 2.**Estimated Average Compensation for Enlisted Personnel in 2006, by Pay Grade and Family Status**

(Dollars)

	Pay Grade								
	E-1	E-2	E-3	E-4	E-5	E-6	E-7	E-8	E-9
Typical Age	18	19	20	22	25	31	37	40	44
Average Years of Experience	<2	<2	<2	3	6	12	18	21	25
Compensation for Single Enlisted Member (High school graduate)									
Cash	29,700	32,000	32,900	37,200	45,000	54,000	63,400	72,400	85,900
Noncash and deferred cash	25,300	26,900	27,600	31,200	35,600	41,800	48,500	54,300	64,900
Total	54,900	58,900	60,500	68,400	80,600	95,700	111,900	126,600	150,700
Compensation for Married Enlisted Member (High school graduate with working spouse, two children) ^a									
Cash	32,800	34,700	36,300	40,400	47,200	56,800	65,200	72,800	89,600
Noncash and deferred cash	37,300	38,900	39,700	49,200	53,700	59,800	64,800	70,200	81,100
Total	70,100	73,600	76,000	89,700	100,900	116,600	130,000	143,000	170,700
Family Premium (Percentage increase in total compensation for enlisted member with dependents)	22	20	20	24	20	18	14	11	12

Source: Congressional Budget Office based on data from the Department of Defense.

Note: Cash pay is regular military compensation (basic pay, allowances for housing and subsistence, and the tax advantage that arises because those allowances are not taxed). Noncash and deferred cash pay include the accrued value of veterans' benefits and retirement benefits (pay and health care). Because veterans' benefits are not funded on an accrual basis, these estimates cannot be compared with amounts in federal budget documents for fiscal year 2006.

Any noncash benefits that these notional enlisted members would not use are excluded from the calculations. For example, if an enlisted member's compensation package includes a family-housing allowance, CBO does not also include a portion of the cost to build or maintain barracks (because most members would not receive both types of housing benefits at the same time). These calculations also exclude the cost of providing fitness centers, clubs, or other recreational activities.

a. The children are assumed to be enrolled in subsidized military child care or school-aged care.

researchers have found that service members in their 20s are more likely to have families than are civilians of comparable ages and education levels.¹⁵

The financial incentive to marry can exceed the value of a promotion. A single 22-year-old E-3 with three years of service earned an average of \$35,145 in regular military compensation in 2006. If he was promoted to E-4 that

year, his annual pay would rise by about 6 percent, to \$37,200. If he was not promoted but married a civilian, his regular military compensation would rise by 9 percent, to \$38,200.¹⁶ Adding in family medical care, greater commissary use, child care, and other noncash benefits widens the compensation gap between personnel with and without families.

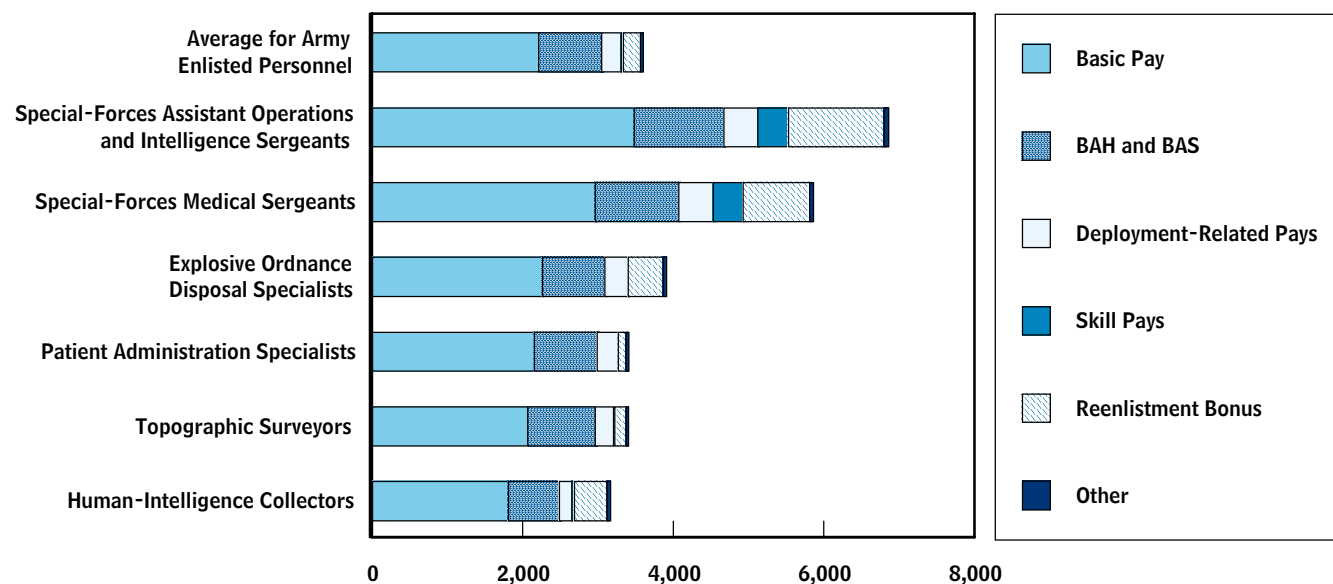
15. John Cadigan, *Family Status of Enlisted Personnel*, CBO Technical Paper 2000-6 (August 2000).

16. That estimate comes from DoD's regular military compensation calculator, available at www.defenselink.mil/militarypay/pay/calc/index.html.

Figure 2.

Average Monthly Pay for Selected Enlisted Occupations in the Army, December 2005

(Dollars)



Source: Congressional Budget Office based on data from the Department of Defense.

Notes: These estimates of monthly pay exclude the federal tax advantage that service members receive because basic allowances for housing and subsistence (BAH and BAS) are not taxed. The estimates also exclude noncash and deferred compensation.

CBO chose these occupations for the pay comparison because they are ones that have experienced persistent shortages or surpluses of personnel in recent years (see Figures 6 and 7) and because they represent some of the skills used in recent overseas operations.

Enlisted personnel in the Army cannot enter the special forces until they reach a pay grade of E-5 or above. Thus, the two special-forces occupations shown here include more senior personnel (with commensurately higher basic pay, BAH, and BAS) than the other occupations do.

Cash Earnings for Selected Occupations

Although regular military compensation varies with a member's rank, experience, and family status, it differs little among military specialties or occupational groups. DoD generally relies on special pays and allowances—which are not part of RMC—to deal with shortages or surpluses in individual occupations or to compensate for difficult situations such as being in combat. (The various special pays associated with deployment and combat are described in Appendix B; those tied to occupational ability and skill are described in Appendix C.)

In the Army, the average enlisted member earned about \$3,000 a month in basic pay and allowances for housing and subsistence at the end of 2005, or about \$3,600 with special pays and bonuses included. For personnel in different occupations, basic pay and allowances were fairly similar (see Figure 2, which shows six selected Army

jobs). Basic pay was larger for special-forces sergeants, however, because sergeants are relatively senior in rank (at least E-5). Moreover, as members of the special forces, they receive higher deployment-related pays and skill pays, as well as significant reenlistment bonuses.¹⁷ Larger reenlistment bonuses are also available to people in the fields of explosive and ordnance disposal and human-intelligence collection. Personnel in those fields or in the special forces have been in great demand since September 11, 2001.

Other researchers have noted the relatively small variation in pay among military occupations, even with special

17. Not all members of an occupational group receive all types of special pays and bonuses in a given month. In calculating the estimates shown in Figure 2, CBO weighted the amount of each type of pay by the probability that an enlisted member would receive it.

pays and allowances included. One study conducted as part of the 9th Quadrennial Review of Military Compensation examined the variability of pay by occupation among the different services.¹⁸ It estimated that about 85 percent of members' cash compensation consisted of RMC, which does not vary by occupational specialty (although it does change with years of experience). Even though special and incentive pays and bonuses vary considerably among the services and among military occupational groups, those variations are overshadowed by RMC.

Comparing Increases in Military and Civilian Pay

Measuring military compensation is instructive, but policymakers and service members also want to compare that compensation with civilian pay. Because basic pay makes up the majority of regular military compensation, one of the most common comparisons is between the annual rise in basic pay and changes in the employment cost index (ECI) for private-sector workers. (For a discussion of the ECI and other measures of civilian compensation, see Box 1.) That comparison is controversial, however, because it is subject to important methodological limitations.

Policymakers have used the ECI as a benchmark measure of civilian pay for comparative purposes since the early 1980s. During that decade, both the Senate Armed Services Committee and DoD noted the increase in the ECI for wages and salaries of civilian workers (including employees of private industry and of state and local governments) over the March-to-March period preceding each year's military pay raise. In 1990, the Federal Employees Pay Comparability Act specified that the ECI for wages and salaries of private-industry workers be used to determine pay increases for federal employees; consequently, that version of the ECI became the basis for the Administration's recommendations on the annual military pay raise and was used in Congressional deliberations. Since 2004, permanent law has required that basic pay be increased by the annual percentage rise in the ECI.¹⁹ Despite that statutory formula, the Congress gen-

erally sets the level of the basic-pay raise in legislation each year, but it frequently bears some relationship to the ECI (such as the change in the ECI plus 0.5 percentage points).

The "Gap" Between Changes in Basic Pay and Civilian Earnings

The cumulative difference between each year's basic-pay raise and the percentage increase in the ECI is commonly referred to as the "pay gap." That measure has been the focus of many policy discussions about the adequacy of military compensation (and about the adequacy of the measure itself).

The pay gap is calculated as follows. Generally, a researcher establishes a year at which the levels of civilian and military pay are considered to be equal and sets indexes for each at 100. Beginning in 1980, basic pay was subject to a series of raises designed to make military and civilian compensation more comparable. (The 1981 pay raise was 12 percent, and the 1982 raise was 14 percent.) Some people have argued that pay "equality" was achieved in 1982, so pay-gap indexes start at 100 in that year for both the military and civilian sectors.

In 1983, military basic pay rose by 4 percent, whereas the average private-sector pay raise (as measured by the ECI) was 8.1 percent. Thus, the military pay index for 1983 was 104, and the comparable civilian index was 108.1. The following year, the military pay raise was again 4 percent, while the ECI increase was 5.6 percent. Therefore, the military pay index rose to 108.16 (104×1.04) and the civilian pay index to 114.15. The pay gap in 1984 is the difference between the military and civilian indexes, or almost -6 percent (see Figure 3).

During the remainder of the 1980s, military basic-pay raises lagged behind increases in the ECI, and the pay gap widened. The cumulative aspect of that measure can make military compensation look low compared with civilian compensation. More recently, increases in basic pay authorized by the Congress since 1999 narrowed the gap to about -5 percent by 2005.

Issues in Using the "Pay Gap" to Evaluate Military Compensation

Comparing increases in basic pay with increases in the ECI has both advantages and drawbacks. One advantage is that the ECI is readily available. The Bureau of Labor Statistics publishes the index quarterly. Another advan-

18. Beth J. Asch, James R. Hosek, and Craig W. Martin, *A Look at Cash Compensation for Active-Duty Military Personnel* (Santa Monica, Calif.: RAND Corporation, 2002).

19. 37 U.S.C. 1009, as amended by the National Defense Authorization Act for Fiscal Year 2004.

Box 1.**The Employment Cost Index and Other Measures of Growth in Civilian Compensation**

The employment cost index (ECI), which is produced quarterly by the Bureau of Labor Statistics, measures the rate of change in compensation per hour worked. It consists of various data series: for workers in private industry; for employees of state and local governments; for civilian workers overall (a combination of the first two); and for individual occupations, industry groups, and other subdivisions. When the ECI was initially published, in 1976, it included only wage and salary changes in private industry. Data on employee benefits were added in 1980, and data on the state and local government sector were added in 1981. The ECI is not affected by short-term changes in employment among industries and occupations.

The wage and salary component of the ECI is derived from estimates of average gross hourly earnings in an occupation (before payroll deductions). The estimates exclude premium pay for overtime, weekend, or late-shift work and nonproduction bonuses, such as lump-sum payments provided instead of wage increases. However, they include production bonuses, incentive earnings, commissions, and cost-of-living allowances. (Earnings of salaried workers and people

paid under incentive systems are converted to an hourly basis.)

The earnings estimates for the ECI come from a survey of about 12,400 private-sector employers and 800 state and local government employers, covering a total of about 60,000 occupations. Those occupations represent more than 90 percent of U.S. workers, excluding only farm, household, and federal government employees.

In 1992 and 1998, researchers at RAND produced an index that was designed to better represent the age, sex, race, education levels, and particular occupations of the military population than the ECI does.¹ According to those researchers, comparisons of civilian and military pay estimated using that “defense employment cost index” (DECI) better tracked the military’s actual recruiting and retention than estimates based on the ECI did. However, the DECI did not gain the acceptance of the Office of Management and Budget or the Congress, and it was never adopted by the Department of Defense.

1. See James R. Hosek and others, *A Civilian Wage Index for Defense Manpower*, MR-990-FMP (Santa Monica, Calif.: RAND, 1998).

tage is that the ECI measures changes in total civilian labor costs in a way that is designed to be free from the influence of shifts in employment among occupations and industries (see Box 1). In addition, the ECI is less volatile than price indexes, such as the consumer price index, and is more directly tied to employment costs.

As a basis for evaluating pay, however, the gap between military and civilian pay raises has some significant limitations.²⁰ First, the broad sample of civilian workers included in the survey that is used to produce the ECI is older than military personnel, on average, and more likely

to have a college degree. Since 1980, the pay of college-educated workers has risen faster than that of high school graduates in the civilian sector. Also, the pay of older civilian workers has generally grown faster than that of younger workers. Because the military primarily recruits young high school graduates, pay raises that were smaller than the increase in the ECI would not necessarily hamper DoD’s efforts to recruit new personnel.

20. CBO produced a technical analysis of those limitations in 1999, and they continue to exist today. See Congressional Budget Office, *What Does the Military “Pay Gap” Mean?* (June 1999).

Box 1.**Continued**

Using the same survey data as the ECI, the Bureau of Labor Statistics developed another measure, the “employer costs for employee compensation” (ECEC) index. Like the ECI, it measures the average hourly cost that employers pay for wages and salaries. The ECEC index has been computed annually since 1986 and quarterly since 2002. It is released about four weeks after the quarterly ECI, making it somewhat less timely.

Unlike the ECI, the ECEC index may reflect shifts in the economy’s mix of occupations and industries as well as changes in labor costs. If policymakers wish to compare military and civilian compensation—with the idea that the military must compensate service members adequately relative to the civilian economy—then an index like the ECEC that incorporates annual changes in the occupational mix of the economy may be preferable to the ECI, which holds the occupational mix constant (until it is updated every 10 years or so).

Using the ECEC index, however, would have the same important drawback as using the ECI: The civilian labor force possesses different demographic characteristics (such as age and education) and a different occupational mix than the military does. Using the ECEC, in which the civilian occupational mix is allowed to fluctuate from year to year, might amplify

that shortcoming relative to the ECI. For example, if the civilian economy is shifting toward a greater proportion of white-collar jobs, the ECEC will be an even poorer benchmark than the ECI for judging the adequacy of military pay. Both indexes can offer guidance to military leaders and the Congress in setting annual raises for military basic pay. But the military and civilian labor markets are different enough that neither index is sufficient to assess the overall adequacy of military compensation.

Other indexes have been proposed over the past 30 years. They include industry wage surveys (which measure the wages paid in various industry occupations) and area wage surveys (which measure the wages paid for certain skills in a particular metropolitan area). The National Survey of Professional, Administrative, Technical, and Clerical Pay—which was used to determine pay raises for federal civil service employees in the 1970s and 1980s—has also been used to assess military pay raises. All of those alternatives have been criticized, however, as being less useful than the ECI because they are either produced less frequently or survey fewer industries or occupations.²

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2. Those surveys, which were formerly separate, have now been integrated into the National Compensation Survey produced by the Bureau of Labor Statistics.

Second, the pay gap measures changes in military and civilian pay over different periods, because it mirrors the procedures for determining annual military pay raises. For example, in calculating the recommended raise included in the President’s proposed budget for 2007, DoD used the change in the ECI from September 2004 to September 2005. The President’s 2007 budget was submitted to the Congress in February 2006. Thus, policy decisions about the 2007 basic-pay raise were not

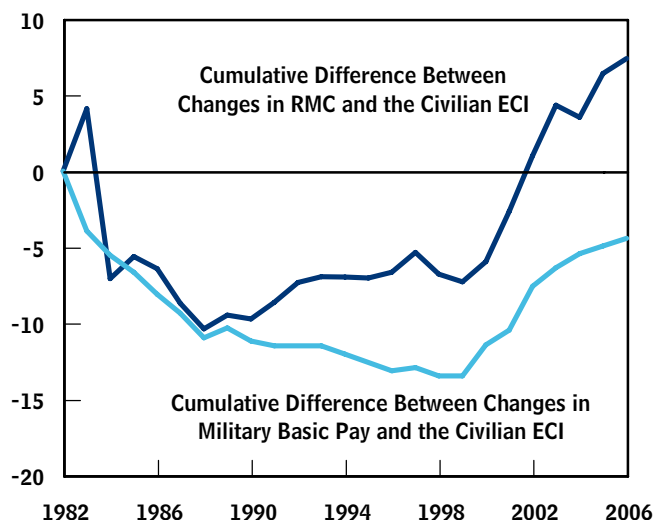
informed by changes in civilian pay during 2006 (at least to the extent that those decisions were based on the President’s budget submission).

Finally, the pay-gap calculation focuses on one part of military compensation—basic pay—and ignores changes in other components. For example, it typically excludes changes in cash allowances for food and housing as well as various noncash benefits.

Figure 3.

Differences Between Military and Private-Sector Pay Raises Since 1982

(Percent)



Source: Congressional Budget Office based on data from the Department of Defense and the Department of Labor.

Notes: RMC = regular military compensation (basic pay, allowances for housing and subsistence, and the federal tax advantage that occurs because those allowances are not taxed); ECI = employment cost index.

These comparisons exclude the military's special pays, bonuses, and noncash benefits.

Increases in Regular Military Compensation Versus the Employment Cost Index

Substituting raises in a broader measure of cash compensation—regular military compensation—for the annual basic-pay raise alters the difference between military and civilian pay (see Figure 3). In 2000, besides raising basic pay, lawmakers authorized a restructuring of housing allowances to eliminate the out-of-pocket expenses typically paid by service members (which had averaged about 20 percent of housing costs).²¹ Several other changes were made as well: Allowance rates were better linked to increases in local housing prices, and service members were given “rate protection” from any declines in those prices.²² As a result of those changes, housing allowances have increased, as have the tax advantages that come from

the allowances’ not being taxed. With housing and food allowances and those tax advantages added to basic pay, increases in military compensation outpaced increases in the ECI beginning in 2000, and the pay gap became a pay surplus after 2002.²³

Comparing Levels of Military and Civilian Pay

The magnitude of military compensation relative to what someone could earn in the civilian sector is an important factor in considering whether to join or remain in the armed services. Thus, comparing the *levels* of military and civilian pay may be more helpful in determining the adequacy of military compensation than comparing *changes* in earnings in the two sectors.

Cash Compensation

Although most enlisted personnel join the military after completing high school, they generally receive some college-level education while on active duty. In 2005, for example, 72 percent of enlisted members had one or more years of college education, CBO estimates (up from 32 percent in 1985). DoD has argued that retaining experienced military personnel requires that their pay be roughly comparable with that of college-educated civilians rather than high school graduates.²⁴

CBO estimates that in 2006, average basic pay for enlisted personnel closely matched the 50th percentile of

21. The authorizing legislation was part of the Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001, signed into law on October 20, 2000.

22. Under that protection, a member's housing allowance cannot be reduced while he or she remains in the same location, retains the same rank, and has no change in dependency status. See Department of Defense, Per Diem, Travel, and Transportation Allowance Committee, *Basic Allowance for Housing Frequently Asked Questions* (April 10, 2007), available at <https://secureapp2.hqda.pentagon.mil/perdiem/bahfaq.html>.

23. That comparison does not include special cash pays and bonuses (such as skill-based pay, deployment pay, or reenlistment bonuses) because they are not part of regular military compensation.

24. See, for example, Department of Defense, *Report of the 9th Quadrennial Review of Military Compensation*. A 2004 CBO analysis offers an alternative to DoD's view. Increases in the educational attainment of enlisted personnel may signal not that pay must rise to be competitive but that the total level of military compensation is increasingly attractive not only to high school graduates but also to people who have (or are interested in obtaining) some postsecondary education. See Congressional Budget Office, *Educational Attainment and Compensation of Enlisted Personnel* (February 2004), p. 3.

estimated earnings for civilians with some college education (see the top panel of Figure 4). With cash allowances and federal tax advantages included, regular military compensation for the average enlisted member exceeded the 75th percentile of civilian earnings. For several years, DoD has stated that its aim is to make RMC comparable with the 70th percentile of civilian earnings.²⁵ CBO's analysis suggests that the goal has been achieved.

To estimate civilian earnings, CBO used data from the 2005 Current Population Survey (obtained from the National Bureau of Economic Research) for male full-time nonagricultural workers. CBO limited the comparison to civilian men because their participation in paid employment more closely mirrors military service than the participation of civilian women does.²⁶ Data on civilian earnings from 2005 were inflated to 2006 using the 12-month percentage change in the ECI to make them comparable with 2006 data for military compensation.

Besides service members, the other component of the federal workforce is federal civilian employees, whose annual pay raises are determined in the same political process as those for military personnel. Average basic pay and RMC for enlisted personnel compare less favorably when the comparison is made with federal civilian employees with some college education (specifically, full-time male white-collar workers, excluding executives).²⁷ Nevertheless, average RMC for enlisted members is at least as high as the 75th percentile of earnings for federal workers with less than seven years of experience (see the bottom panel of Figure 4). Most enlisted personnel have served for less than seven years.

A 2001 study of military compensation by RAND argued that housing allowances should not be included in mea-

sures of compensation for enlisted members in their first few years of service, because such members must live in barracks during their initial training.²⁸ The study's authors substituted a lower imputed value for housing, which in turn lowered average military compensation for members in their first two years of service. For comparison, CBO estimated the annual per-person cost of barracks housing in 2006 using data on construction and operating costs from DoD. Substituting that estimated barracks cost for the basic housing allowance would increase total compensation for the youngest enlisted members rather than lower it, but the difference would be small.²⁹

Noncash and Deferred Benefits

The military–civilian comparisons described so far in this analysis have focused on cash compensation, not noncash and deferred benefits. Including benefits can add another level of complexity to analytical studies, for several reasons. First, qualitative differences exist between military and civilian benefits that may be difficult to measure. For example, the Department of Labor measures the percentage of employers that offer life insurance or dental care, but evaluating the value of those plans is difficult. Also, private employers offer a wide variety of noncash compensation, so identifying the “average” civilian benefit package would be hard and perhaps misleading. Finally, for both DoD and civilian employers, the cost of providing benefits may be significantly different from the value that an employee places on those benefits.

This analysis and earlier studies by CBO, the Government Accountability Office, and the Center for Naval Analyses suggest that in recent years, noncash and deferred benefits have accounted for about 50 percent to 60 percent of military compensation.³⁰ That range is

25. Department of Defense, *Report of the 9th Quadrennial Review of Military Compensation*.

26. In the civilian sector, women are more likely than men to take extended absences from paid employment during their adult lives, perhaps to care for young children or elderly relatives. Military personnel—whether male or female—are much less likely to leave active duty for several years and return later.

27. White-collar federal employees are those in the General Schedule and related pay plans. Military occupations span both white-collar and blue-collar jobs. Adding blue-collar (or wage-grade) workers would lower average civilian pay, making military compensation compare more favorably.

28. See Beth J. Asch, James R. Hosek, and John T. Warner, *An Analysis of Pay for Enlisted Personnel*, Documented Briefing (Santa Monica, Calif.: RAND, 2001), p. 19.

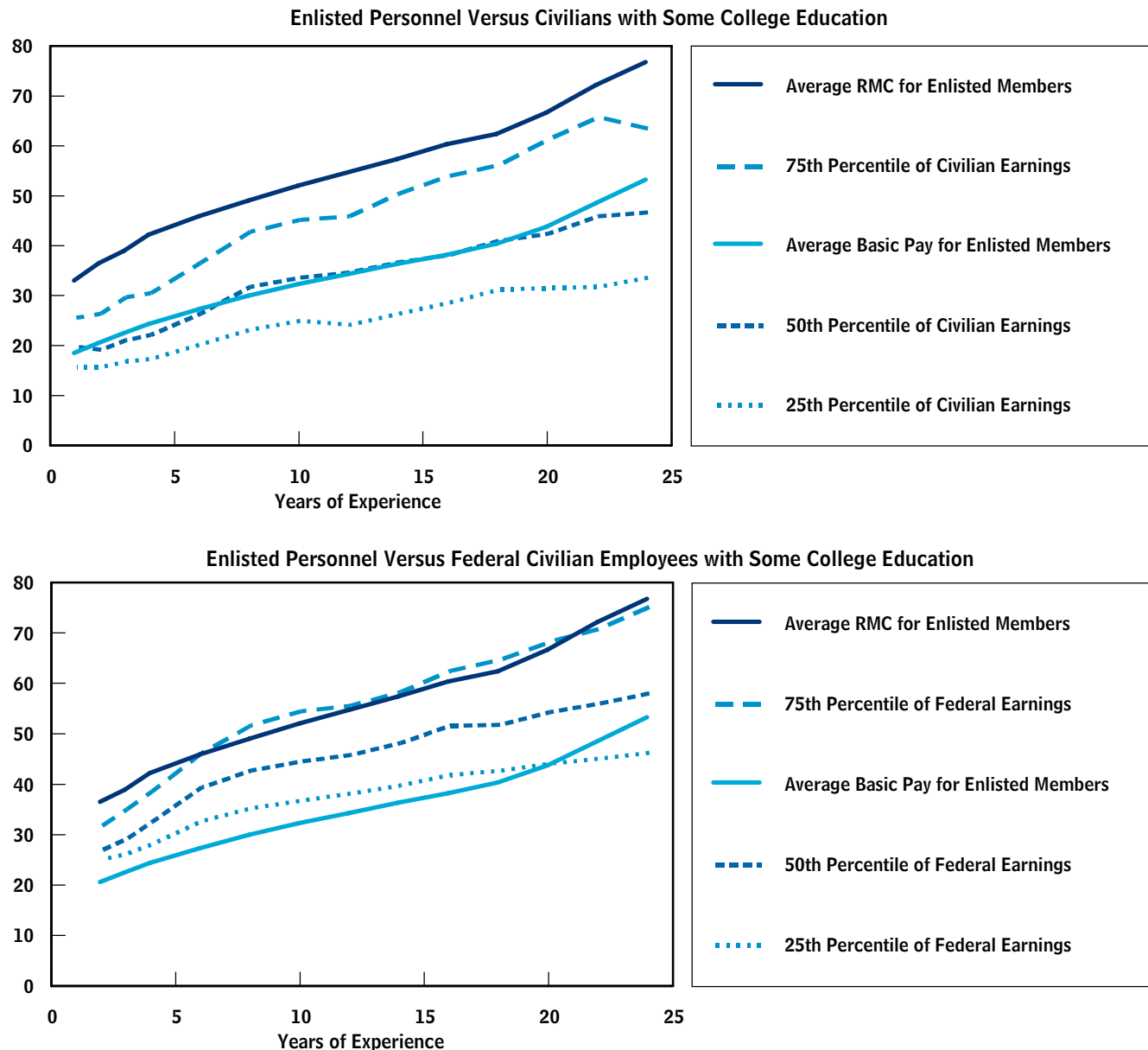
29. In one example, CBO estimated a barracks cost of \$11,700 per person per year. An E-2 with one year of service would receive a basic housing allowance and associated tax advantage of about \$11,000 per year.

30. See Congressional Budget Office, *Military Compensation*; Government Accountability Office, *Military Personnel*, p. 15; and Grefer, Miller, and Gregory, *Comparing the Relative Value of Active Duty and Civilian Compensation Packages*.

Figure 4.

Annual Earnings of Enlisted Personnel Compared with Those of Civilian Workers or Federal Employees, 2006

(Thousands of dollars)



Source: Congressional Budget Office based on data from the Department of Defense, the Department of Labor, and the Office of Personnel Management.

Notes: RMC = regular military compensation (basic pay, allowances for housing and subsistence, and the federal tax advantage that occurs because those allowances are not taxed).

Civilian data include reported 2005 earnings for male full-time nonagricultural workers, by age, inflated to 2006 using the employment cost index. Federal data include 2005 cash compensation for full-time male white-collar workers (those in the General Schedule and related pay plans), by age, inflated to 2006 using the federal pay raise. CBO estimated the years of experience for all civilian workers.

much higher than among large private employers or government, where workers typically receive about one-third of their compensation in the form of benefits.³¹ In addition, whereas both the military and many large private employers provide retirement benefits, health insurance, life insurance, and paid time off, service members have access to benefits that are not routinely offered in the private sector—such as free or low-cost health care, housing allowances, education assistance, and discount shopping at commissaries and exchanges.³²

For this study, CBO reviewed the fraction of civilian employers offering various benefits and the form those benefits might take. Military retirement, health care, and family-support benefits all vary from the benefits most commonly offered by civilian employers.

Retirement. The military retirement system is one of the most distinctive aspects of military compensation. It differs from most civilian retirement plans in three main ways:

- It is predominantly a defined-benefit system that requires no contributions from employees (although service members can now contribute to retirement accounts in the federal Thrift Savings Plan, a defined-contribution plan);³³
- It generally requires 20 years of service for vesting; and

- It begins paying benefits as soon as the member has left the service, as early as 38 years of age.

Each of those features is far less common in private-sector retirement plans.

In 2006, 90 percent of medium to large private employers (those with more than 100 workers) provided some form of retirement plan. However, less than 40 percent of those employers that did so offered a defined-benefit plan, as the military does. Defined-contribution plans were more common, offered by almost 90 percent of medium to large employers.³⁴

The military retirement system uses “cliff” vesting, meaning that nondisabled members who leave before serving for 20 years receive nothing, whereas those who stay receive full retirement benefits. According to DoD’s Office of the Actuary, 46 percent of officers and 15 percent of enlisted personnel stay in the service for the necessary 20 years.³⁵

Vesting rules for private-sector retirement plans are governed by federal legislation.³⁶ In 2002, changes to those rules required all 401(k) defined-contribution plans with cliff vesting to give employees the right to take 100 percent of their employer’s matching contributions after three years on the job (reduced from five years). Defined-benefit plans that use cliff vesting must grant employees the right to 100 percent of their employer’s contributions after five years.

Some private employers that offer 401(k) plans use graduated vesting rather than cliff vesting. In that system, employees receive a 20 percent share in their employer’s

31. See, for example, Department of Labor, Bureau of Labor Statistics, *Employer Costs for Employee Compensation—December 2006* (March 29, 2007), Table 3, available at www.bls.gov/news.release/pdf/cecc.pdf; and Congressional Budget Office, *Comparing Federal Employee Benefits with Those in the Private Sector* (August 1998), pp. vi and 1.

32. Government Accountability Office, *Military Personnel: Active Duty Benefits Reflect Changing Demographics, but Continued Focus Is Needed*, Testimony before the Subcommittee on Personnel of the Senate Armed Services Committee, GAO-02-557T (April 11, 2002), p. 10.

33. In a defined-benefit plan, benefits are calculated according to a formula that is generally based on years of service and salary. Pension benefits begin at a specified age. In a defined-contribution plan, by contrast, employees contribute to individual accounts according to a predetermined formula, often with the employer matching some or all of the employee’s contributions. Benefits equal contributions plus accrued returns on that investment. The most common type of defined-contribution plan is a 401(k) plan. See Employee Benefits Research Institute, *The U.S. Retirement Income System*, Fact Sheet 188 (Washington, D.C.: EBRI, April 2005).

34. Department of Labor, Bureau of Labor Statistics, *National Compensation Survey: Employee Benefits in Private Industry in the United States, March 2006* (August 24, 2006). That survey does not include state and local governments.

35. Department of Defense, Office of the Actuary, *Valuation of the Military Retirement System* (September 30, 2005), p. 12. Some disabled personnel can retire with less than 20 years of service. Service members who leave active duty and become reservists can qualify for a pension beginning at age 60 if they serve long enough.

36. Most of the rules are set out in the Employee Retirement Income Security Act of 1974 (ERISA). Employees are always entitled to all of their own contributions—vesting rules govern when they become entitled to their employers’ contributions. The military system is exempt from ERISA.

matching contributions after two years of service and then another 20 percent share after each additional year. Thus, employees reach the 100 percent vesting level after completing six years on the job.³⁷ In the case of defined-benefit plans with graduated vesting, employees receive the first 20 percent share after three years of service, so 100 percent vesting takes seven years. Those various rules mean that all private-sector workers whose employers offer a retirement plan will be fully vested much earlier than their military counterparts.

On the flip side, service members who complete a 20-year career receive annuity payments as soon as they leave the service—which, for an enlisted member who joined immediately after high school, could be as early as age 38. Thus, many retired military personnel begin second careers, in which they may also participate in a private-sector retirement plan. In a 2003 survey of military retirees, for example, more than 75 percent of respondents ages 38 to 54 reported that they were working full time, as were more than 50 percent of respondents ages 55 to 64.³⁸ (Those data include service members who retired with a disability.)

Unlike the military retirement system, civilian employers' defined-benefit plans have a set retirement age (frequently 65) below which participants cannot receive benefits. Defined-contribution plans may allow participants to take some or all of their vested accrued benefits when they leave their particular employer, but tax penalties apply if those funds are not reinvested in another retirement plan or are withdrawn before age 59 and a half.

Health Care. The types of health plans that workers have and the amount they pay for those plans differ significantly between the military and civilian sectors. Like the military, nearly all large civilian employers offered health care benefits to their workers last year; but unlike the military, only about one-third offered such benefits to their retirees.³⁹ Of the civilian workers who participated in a medical plan, about 20 percent were enrolled in a health maintenance organization (HMO).⁴⁰ By comparison,

75 percent of active-duty families were enrolled in the military's HMO plan, TRICARE Prime, in 2005.⁴¹

Most civilian workers must pay some of the premium for their employment-based medical plan.⁴² Those with single coverage paid an average of 16 percent (or \$627 per year) in 2006, and workers with family coverage paid 27 percent (about \$2,973 per year). Most beneficiaries of DoD's health plans, by comparison, pay no premium. The only exception is military retirees who have not reached the eligibility age for Medicare; they must pay an annual premium of \$460 per family to enroll in TRICARE Prime.

Likewise, out-of-pocket costs are lower for families in TRICARE Prime than for their counterparts in civilian HMOs, DoD estimates.⁴³ On average, families of active-duty personnel paid \$92 in medical copayments, deductibles, and supplemental insurance premiums in fiscal year 2005. Civilian members of HMOs paid more than 30 times that amount, or \$3,193, in premiums, copayments, and deductibles. Families of military retirees who are not eligible for Medicare (primarily those under age 65) paid \$746 in 2005, whereas civilian retirees (regardless of age) paid about \$3,681.

DoD has also compared the out-of-pocket health costs of families who use its preferred-provider organization (PPO) or fee-for-service options with those of civilians

37. Department of Labor, Employee Benefits Security Administration, *What You Should Know About Your Retirement Plan* (November 2006).

38. Patrick C. Mackin and Kimberly L. Darling, *Econometric Analysis of 2003 Data on the Post-Service Earnings of Military Retirees*, Report 2004-011 (Department of Defense, Defense Manpower Data Center, June 2004), p. 17.

39. Kaiser Family Foundation and Health Research and Educational Trust, *Employer Health Benefits: 2006 Summary of Findings* (September 26, 2006). Large civilian employers were defined in this calculation as private firms or state and local governments with at least 200 workers.

40. Ibid. Of the rest, 60 percent were enrolled in preferred provider organizations, 13 percent in point-of-service plans, 4 percent in high-deductible health plans with savings options, and 3 percent in conventional (indemnity) plans.

41. Department of Defense, *Evaluation of the TRICARE Program: FY 2006 Report to Congress* (March 13, 2006). Of the other active-duty families, 14 percent used TRICARE's preferred provider organization or fee-for-service plans, and 11 percent used other health insurance (generally provided by a spouse's employer).

42. Kaiser Family Foundation and Health Research and Educational Trust, *Employer Health Benefits*. In 2006, 75 percent of employees with single coverage and more than 90 percent of those with family coverage were required to pay a portion of their premium.

43. See Department of Defense, *Evaluation of the TRICARE Program*, pp. 87–89. That comparison controlled for demographic differences between military and civilian families.

using PPO plans. In 2005, the department estimates, those active-duty families paid about \$138 per year out of pocket, while privately employed families of similar age and education spent about \$3,330 on out-of-pocket costs.

Thus, regardless of their type of military health plan, active-duty personnel with families pay about \$3,000 less for health care each year than they might expect to pay if they were privately employed. That amount represents an addition of about 7 percent to the regular military compensation of a married E-4 with four years of service.

Although employees of the federal government are known for having generous health benefits, they too appear to pay more for health insurance than military personnel do.⁴⁴ A study comparing TRICARE with the Federal Employees Health Benefits program concluded that active-duty service members pay less in out-of-pocket costs (including premium costs) for health care than comparable federal civilians do.⁴⁵ The estimated cost differences ranged from \$1,000 per year for an HMO option to \$1,700 per year for a standard fee-for-service plan.

Other Noncash Benefits. Quality-of-life benefits, such as child care and recreation facilities, are much less common in the private sector than they are in the military. Only 9 percent of large civilian employers offered on- or off-site child care in 2006, and 19 percent offered child care resource and referral services. DoD provides on-base child care (in either child care centers or with family-based caregivers) as well as referral services. Likewise, whereas about 70 percent of large civilian employers offered life insurance benefits, 63 percent had employee-assistance programs, about half provided disability insurance, and 22 percent offered fitness centers, the military offered all of those benefits to both service members and their dependents.⁴⁶ DoD views many of those programs as a way of supporting the quality of life for military families.⁴⁷

44. See Congressional Budget Office, *Comparing Federal Employee Benefits with Those in the Private Sector*.

45. See Richard D. Miller and Robert A. Levy, *Comparing TRICARE with Other Federal and Civilian Health Plans*, Research Memorandum D0009542.A2 (Alexandria, Va.: CNA Corporation, March 2004).

46. Department of Labor, *National Compensation Survey: March 2006*.

Issues in Providing Noncash Benefits. Noncash compensation is sometimes seen as less economically efficient than cash compensation because it restricts the way in which people can choose to spend their earnings. For example, an economist might argue that on-base fitness centers are economically less efficient than a “fitness allowance” that can be spent in whatever way the employee chooses.

The popularity of noncash and deferred benefits, however, may stem in part from the fact that many of them are not taxed (or the tax liability may be postponed for many years). For example, workers can pay their share of employment-based health plans with pretax dollars, whereas individually purchased health plans are paid for mainly with after-tax dollars.

Another reason that employers might offer noncash compensation is to provide a way of screening for or maintaining desirable employee characteristics. On-site fitness centers, for instance, may attract employees who value physical fitness, and retirement plans may attract workers who are patient and forward-looking.

Yet another reason for offering a noncash benefit is if the benefit fosters goodwill or loyalty to the employer—and thus reduces employee turnover—by being seen as a gift.⁴⁸ Subsidized child care, financial counseling, housing, or other so-called family-support benefits may provide that “gift effect.” In the military, personnel who are deployed frequently may especially value the feeling that their families are being cared for while they are away.

General Limitations of Military–Civilian Comparisons

Evaluating whether a military job is comparable to a civilian job can be difficult. Military aviation specialists, for example, may not work under the same conditions as their civilian counterparts. They may be expected to deploy, whereas civilians might stay in the same location throughout their employment. Job security, autonomy in performing tasks, group solidarity, or other intangible rewards may be different. One would expect compensa-

47. See Department of Defense, Deputy Under Secretary of Defense for Military Community and Family Policy, *A Modernized Social Compact* (May 2004).

48. George Akerlof, “Labor Contracts as a Partial Gift Exchange,” *Quarterly Journal of Economics*, vol. 97, no. 4 (November 1982), pp. 543–569.

Box 2.**Compensating Service Members for Combat**

Attracting and retaining the best military personnel would seem especially challenging during wartime. Although on any given day, only about 160,000 of the 1.3 million active-duty service members are deployed in the Iraq or Afghan theaters, most people enlisting today in the Army or the Marine Corps can expect to see combat. Intuitively, many observers would assume that those personnel would demand additional compensation for their added risk of injury and death. (Economists sometimes refer to that additional compensation as a “compensating differential.”)

The use of special combat-related pays is controversial, however. Policymakers have debated the pros and cons of such compensation for more than 60 years. Although the Department of Defense (DoD) and the Congress want to recognize the sacrifices asked of service members who are placed in the greatest danger, many of those decisionmakers argue that the basic purpose of a military force is to fight. Supporters of that view maintain that military personnel accepted the possibility that they would be sent into combat when they joined the service, so if pay is too low to maintain a force that is ready to fight, then a general pay raise is preferable to higher special pays.¹

Combat- and Deployment-Related Pays

Currently, two types of special pays are directly linked to combat: imminent-danger pay and hardship-duty pay. Both types can be earned by personnel who serve

in a location officially designated for such pay. In 2006, for example, members serving in Iraq or Afghanistan could earn an extra \$325 per month in imminent-danger and hardship-duty pay. The linkage with combat is not perfect, in that any service member who is in a designated area during any part of a month is entitled to receive the full month’s worth of compensation, whether or not that member is engaged in combat activities.

Other special pays and tax benefits are available to deployed personnel (see the list in Appendix B). For instance, family-separation allowances are designed to compensate service members who are away from home for long periods, whether in combat or not. Personnel with especially dangerous duties, such as explosives demolition, receive hazardous-duty pay. (Members serving in Iraq and Afghanistan earn those pays in addition to the ones described above.) Similarly, personnel who possess particular skills or are in certain occupations may earn a lump-sum enlistment or reenlistment bonus. All income earned by enlisted personnel and warrant officers while serving in a combat zone—including special pays and bonuses—is exempt from federal income taxes. (For commissioned officers, the exemption is capped at the highest enlisted pay, plus any imminent-danger or hostile-fire pay received.)

Estimating Whether Wartime Pay Is Adequate

Do service members view all of those additions to their paycheck—or only the combat-related pays—as sufficient compensation for serving in dangerous areas? Or do they not consider additional pay necessary at all? The answers are difficult to know for sure, so estimating a “compensating differential” in that way is problematic.

1. For a comprehensive review of the legislative history of combat-related pay, see Department of Defense, Under Secretary of Defense for Personnel and Readiness, *Military Compensation Background Papers*, 6th ed. (May 2005), pp. 250–265.

Box 2.**Continued**

An alternative gauge of the adequacy of military compensation during wartime focuses on recruiting and retention. Is compensation too low to induce people to join or remain in the military—particularly those who expect to serve in Iraq or Afghanistan? Both the Army and the Marine Corps added bonus compensation (above and beyond the special pays discussed above) for some occupational specialties in recent years. For example, the Army has quadrupled its annual budget for selective reenlistment bonuses since 2002. During most of those years, it has faced significant challenges with recruiting and retention, although it met its goals in 2006. The Marine Corps met its recruiting and retention goals each year from 2000 to 2006 (although its spending on enlistment and reenlistment bonuses was lower in 2005 than before Operation Iraqi Freedom began).²

Despite those observations, it is difficult to determine whether raising special pays and bonuses adequately compensates military personnel for the risks of wartime service, because the armed forces have other ways to meet their recruiting and retention goals. For instance:

- They can institute stop-loss policies, which prohibit members from leaving at the end of their obligated term of service.
- They can reduce attrition, such as the number of people let go during boot camp.
- They can lower their recruiting standards (by accepting more people who have earned General Educational Development credentials instead of high school diplomas, for example, or by waiving civilian behavior that would have kept potential recruits from joining in the past).
- They can increase the number of recruiters and the amount of advertising they do.
- DoD can request that the Congress increase the annual basic-pay raise or give higher basic-pay raises to senior enlisted personnel, regardless of where they serve.

DoD has employed each of those methods (besides boosting special pays, bonuses, and allowances) since 2002. A careful analysis of how to separate those influences to estimate a “compensating differential”—or an exploration of whether such an analysis is feasible—is beyond the scope of this study.

2. For more information, see Congressional Budget Office, *Recruiting, Retention, and Future Levels of Military Personnel* (October 2006).

tion to be higher for jobs that have many negative characteristics, even if those characteristics are hard to measure empirically. (Box 2 discusses the special case of compensating service members for combat.)

Pay comparisons may also ignore the value of training. The military invests a significant amount of money in training its personnel. DoD generally tries to recruit capable people who are graduating from high school or have some college education and then trains them in the skills necessary for military life and for their particular occupational specialty.⁴⁹ Civilian employers, by contrast, generally hire people who have already been trained (although most large employers offer work-related education assistance).⁵⁰ In addition, civilian employers are more likely to hire people at various levels of experience.

Differing career patterns between military and civilian personnel also complicate pay comparisons. Because the military “promotes from within,” pay may need to be higher for new recruits than for civilians of similar ages and education levels, as DoD tries to compete for the best pool of recruits from which to select the best career per-

49. Certain medical personnel and other professionals may enter the military after receiving private training. They enter at a slightly higher rank (E-3 or O-3) than untrained recruits do. In addition, DoD has been exploring ways to recruit college graduates with particular majors (such as engineering or finance) into the enlisted force and ways to offer pay grades higher than E-3 to more-capable recruits.

50. Department of Labor, *National Compensation Survey: Employee Benefits in Private Industry in the United States, March 2006*, p. 28.

sonnel. Also, data on average civilian compensation (such as those shown in Figure 4 on page 14) include the pay of people who are successful in their civilian careers as well as the pay of people who are not. But in the military, the “up-or-out” promotion system means that the least successful personnel have left military service before reaching the more senior levels.⁵¹

Moreover, pay comparisons generally measure individual income instead of household income. Yet military spouses may have lower earnings than comparable civilians because of frequent moves and more-disrupted careers. Thus, household income may be lower for a military family than for a civilian family (after controlling for other variables) even though one of the family members receives relatively high pay.⁵²

Finally, pay comparisons offer only one method of evaluating the efficiency and effectiveness of a compensation system. DoD has outlined several principles for military compensation.⁵³ One of those principles—that service members believe they are being treated fairly—requires that military compensation be equitable relative to civilian compensation. Other principles around which DoD has designed its compensation system include:

- Being flexible and adaptive enough to respond to changes in service members’ skills and abilities or to changing strategic and operational plans;
- Being able to attract, retain, and motivate the force to perform in difficult or stressful conditions;
- Allowing for rapid and smooth expansions or contractions of the force during wartime or peacetime;
- Encouraging personnel to perform well and advance to higher responsibilities; and

51. For more details about pay profiles in the military, see Beth J. Asch and John T. Warner, *A Theory of Military Compensation and Personnel Policy*, MR-439-OSD (Santa Monica, Calif.: RAND, 1994); and Congressional Budget Office, *Military Pay and the Rewards for Performance* (December 1995).

52. James Hosek and others, *Married to the Military: The Employment and Earnings of Military Wives Compared with Those of Civilian Wives*, MR-1565-OSD (Santa Monica, Calif.: RAND, 2002).

53. See Department of Defense, Under Secretary of Defense for Personnel and Readiness, *Military Compensation Background Papers*, 6th ed. (May 2005), pp. 4–10.

- Not being unduly expensive or inefficient, so compensation does not take financial resources away from other government needs.

Whether the military compensation system achieves those goals—or what policies can ensure that those goals are met—is the subject of extensive research and debate.

Linking Military Compensation to Recruiting and Retention

One measure of the effectiveness of DoD’s compensation system is how well the military can attract and retain high-quality, skilled personnel. Overall, DoD has met its goals in recruiting and retaining active-duty members in recent years. One reason may be that military compensation—both cash and noncash—compares favorably with civilian options. Nevertheless, even if military and civilian pay are roughly comparable, DoD may experience persistent shortages of personnel in some occupations and surpluses in others.

The military pay system is also costly: The DoD-funded portion of military compensation alone costs more than \$140 billion in fiscal year 2007, CBO estimates. Research suggests that altering the mix of cash and noncash compensation may enable DoD to maintain an even more effective force for the same total cost.

Effectiveness of Using Pay to Resolve Occupational Shortages or Surpluses

Although many studies compare average military and civilian pay, additional insights may come from comparing pay for selected occupations. The military has hundreds of occupations, each of which could be seen as its own small labor market. DoD generally uses special pays, bonuses, and promotion rates to distinguish between different groups. Additional reenlistment bonuses may be offered to increase retention of Arabic speakers, for instance. But are recent increases in cash pay able to match supply with demand for particular skills or occupations?

Comparing Pay for Certain Army Jobs and Their Civilian Counterparts. As an illustration, CBO chose six jobs in the Army’s enlisted force that it identified as having persistent shortages or surpluses of personnel—patient administration specialist, human-intelligence collector, topographic surveyor, explosive ordnance disposal specialist, special-forces medical sergeant, and special-forces

Table 3.**Army Specialties and Comparable Civilian Occupations**

Army Occupational Specialty	Similar Civilian Occupation(s)
Patient administration specialist	Medical records and health information technician
Human-intelligence collector	Interpreter, translator
Topographic surveyor	Surveying and mapping technician
Explosive ordnance disposal specialist	Explosives worker, ordnance handling expert, blaster
Special-forces medical sergeant	Emergency medical technician, paramedic, physician assistant
Special-forces assistant operations and intelligence sergeant	Operations research analyst, management analyst, emergency management specialist

Source: Congressional Budget Office based on information from the Army and the Department of Labor.

assistant operations and intelligence sergeant (see Table 3).⁵⁴ It then identified similar civilian occupations (using Army guidelines), obtained data on wages and employment in those occupations from the Department of Labor, and compared trends in cash earnings in the military and civilian versions of those jobs between 1999 and 2005.⁵⁵

When more than one civilian occupation seemed like a reasonable analog for a military specialty, CBO constructed a composite civilian wage by weighting the average wage for each occupation by its employment. In particular, the Army says that there are no directly related occupations for the two types of special-forces sergeants that CBO examined. However, the Army states that the skills acquired while serving as a special-forces assistant operations and intelligence sergeant will most closely match those of civilian operations research analysts, or management specialists in human resources, training, or labor relations. On the basis of that description, CBO combined data for three civilian occupations: operations

research analyst, management analyst, and emergency management specialist. Special-forces medical sergeants were described as leaving the Army with sufficient skills to work as emergency medical technicians, paramedics, or (with some civilian training) physician assistants. CBO combined wage and employment information for those three occupations to compare with special-forces medical sergeants.

Even when a close match exists between a civilian occupation and a military specialty, average pay can vary between the two, for several reasons. Civilians employed in a given occupation may have very different ages, education levels, or years of experience than their military counterparts. Also, military specialties may be more dangerous, less flexible, or more rigorous than civilian counterparts (particularly in the case of special-forces jobs).

To reduce those potential differences and to emphasize relative growth rates rather than absolute pay levels, CBO computed the ratio of military cash earnings for a specialty to average cash earnings for comparable civilian occupations and looked at changes in that ratio since 1999. Over that period, earnings increased more quickly for all six military specialties than for their civilian equivalents, resulting in rising ratios (see Figure 5).

Personnel Shortages or Surpluses in Those Jobs. Of the six Army specialties in CBO's analysis, the four that have experienced persistent shortages of personnel are the two special-forces occupations, human-intelligence collector, and explosive ordnance disposal specialist. Those occupations also have higher-than-average reenlistment bonuses

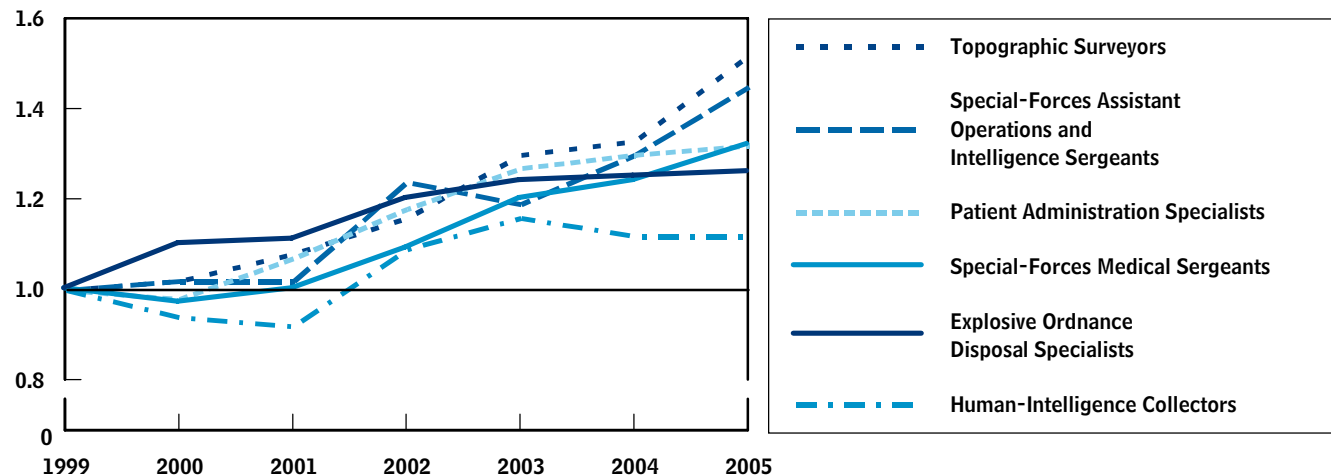
54. CBO defined an occupation as experiencing a persistent shortage if the Army filled no more than 90 percent of the authorized positions in that occupation each year since 1999. A persistent surplus was assumed to exist if at least 110 percent of the authorized positions in a particular occupation were filled each year since 1999. (Such surpluses occur when the number of personnel in a particular specialty exceeds the stated numerical requirements for that specialty.)

55. The Army identifies civilian occupations that it considers close to Army specialties on its Web site, www.GoArmy.com (under "Careers & Jobs").

Figure 5.

Ratio of Annual Cash Earnings in the Army to Civilian Earnings for Selected Occupations

(Index, 1999 = 1.0)



Source: Congressional Budget Office based on data from the Army and the Department of Labor.

Note: Army earnings include special pays and bonuses. The occupations shown here are Army specialties; comparable civilian jobs are listed in Table 3. Data on civilian earnings come from the Bureau of Labor Statistics's annual Occupational Employment Statistics Survey.

associated with them (see Figure 2 on page 8). The specialties that have had personnel surpluses—patient administration specialist and topographic surveyor—have no significant skill pay associated with them and relatively small reenlistment bonuses.

CBO chose the four occupations with shortages because, although they are relatively small specialties within the Army, they represent the types of skills used in recent overseas operations. Total cash earnings for those specialties—including special pays, bonuses, and allowances—have risen since 1999, adjusted both for inflation and for wage increases in comparable civilian occupations. Nevertheless, the percentage of authorized positions that have been filled has remained well below 100 percent—in some cases, falling to 44 percent or 65 percent (see Figure 6). Those data suggest that, even in occupations with known shortages, the military compensation system is less effective and efficient than DoD policy requires.

At the same time, military personnel working as patient administration specialists or topographic surveyors have seen their pay rise relative to that of their civilian counterparts, despite the fact that those occupations have been at least 100 percent filled (see Figure 7). That situation suggests that policies that remedy a perceived pay gap by

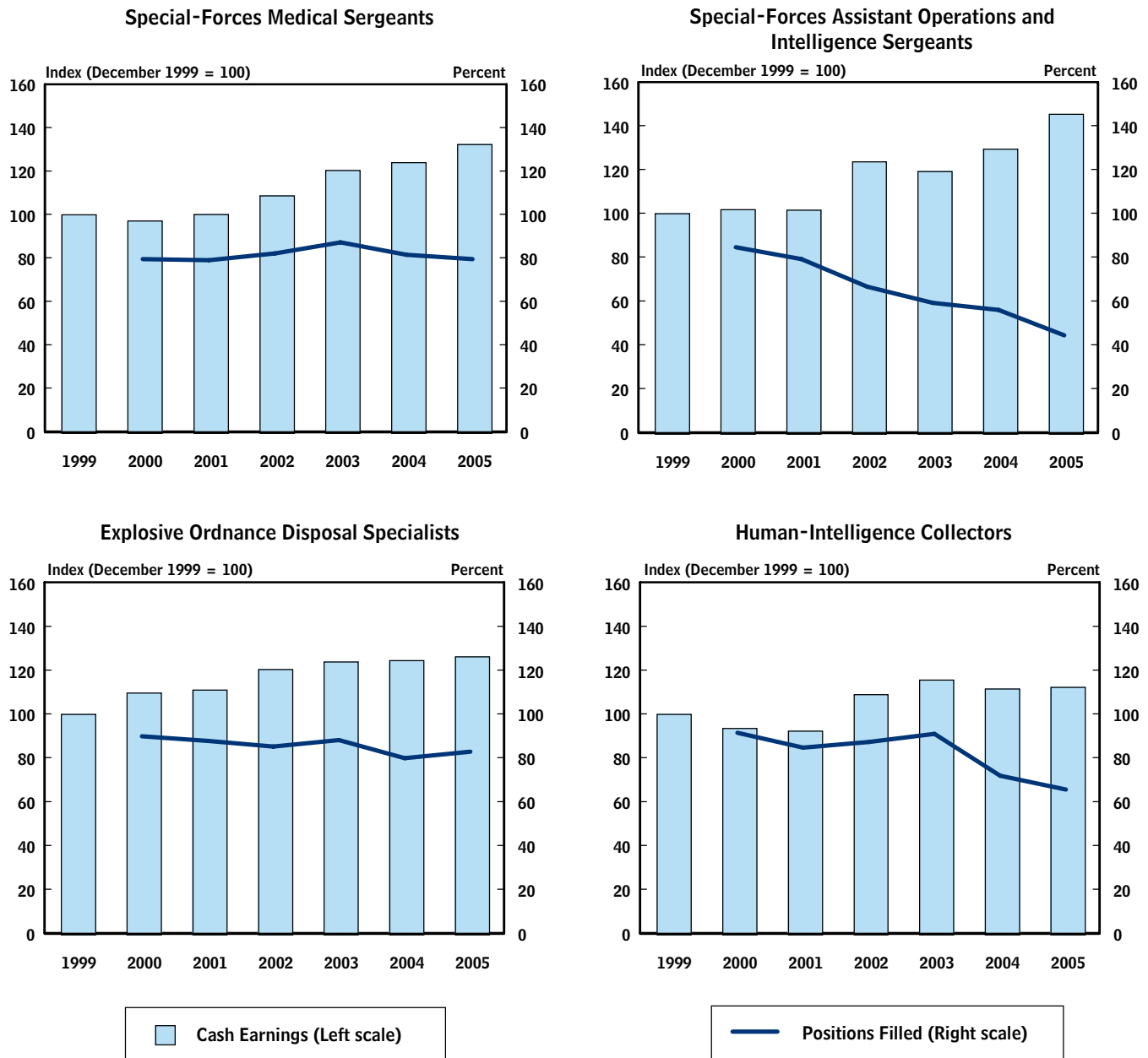
making overall military pay comparable with civilian pay play a limited role in resolving personnel shortages and surpluses among Army occupations.⁵⁶ Although average cash earnings in the Army have increased by almost 40 percent since 1999 (adjusted for inflation), and although average retention has generally been good, labor shortages or surpluses have persisted for specific specialties.

The Role of Special Pays. Bonuses and special pays can be used to vary compensation among occupations, although they make up a much smaller fraction of total pay than basic pay or regular military compensation does. A review of the various types of special pays that the military offers (listed in Appendix C) suggests that they are concentrated in relatively few specialties, including nuclear fields (in the Navy), aviation, medicine, foreign languages, and special operations. Tailoring pay to address specific shortages or surpluses could be more effective and less costly than giving across-the-board pay raises. A compensation package that does not vary substantially among occupations may encourage highly trained or highly sought after

56. In addition to measuring pay increases for military personnel relative to those for civilians in similar occupations, CBO measured them relative to increases in inflation (specifically, the consumer price index for all urban consumers). The results were similar.

Figure 6.

Pay Increases and Personnel Levels for Selected Army Enlisted Occupations With Shortages

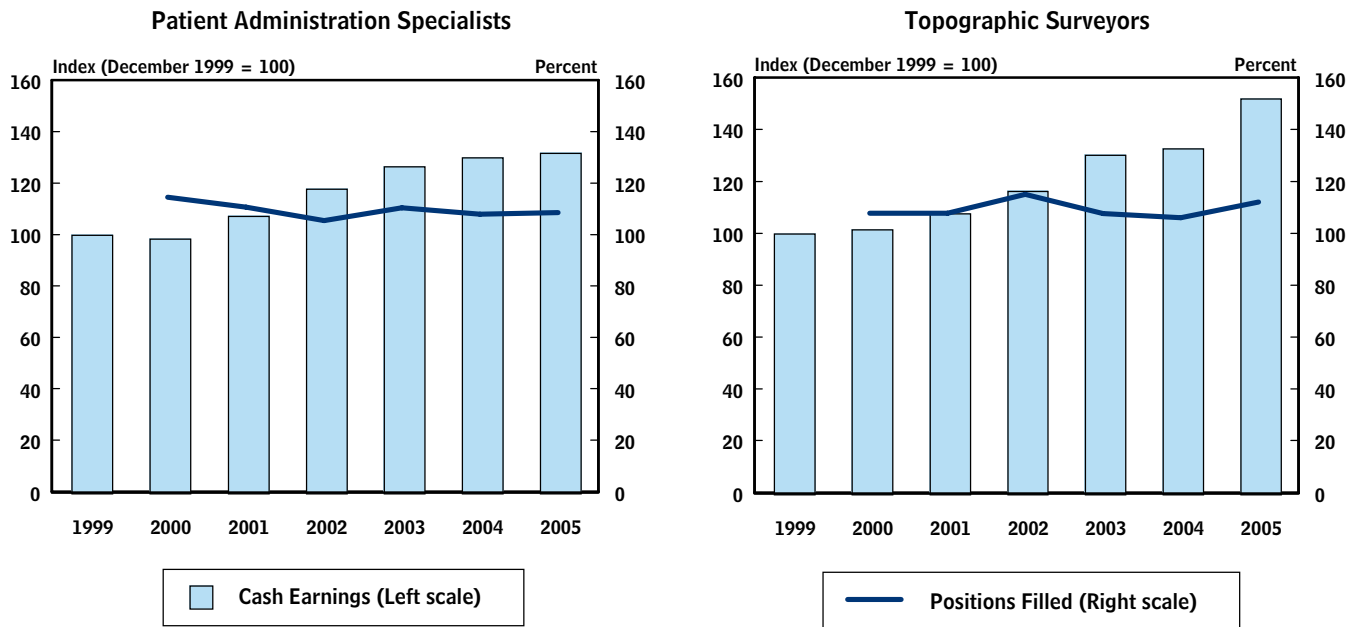


Source: Congressional Budget Office based on data from the Department of Defense (adjusted for changes in wages for civilian occupations using data from the Department of Labor).

Note: Data are for December of each year. Cash earnings include all special pays, bonuses, and allowances but exclude tax advantages and noncash benefits.

Figure 7.

Pay Increases and Personnel Levels for Selected Army Enlisted Occupations Without Shortages



Source: Congressional Budget Office based on data from the Department of Defense (adjusted for changes in wages for civilian occupations using data from the Department of Labor).

Note: Data are for December of each year. Cash earnings include all special pays, bonuses, and allowances but exclude tax advantages and noncash benefits.

personnel to leave the military and become contractors. (That concern has been expressed by some policymakers in assessing the use of contractors in Operation Iraqi Freedom.)

The pay and health care system for military retirees can also limit occupational flexibility. In specialties that are manned with older, higher-ranking personnel, persistent surpluses can exist even if current compensation does not rise substantially, as senior personnel wait to reach their 20-year vesting point before leaving the service. Reducing special pays or reenlistment bonuses for those occupations might have only limited effectiveness in resolving persistent surpluses. Reducing deferred pay and benefits may be the most effective way to reduce surpluses of senior personnel.

The data shown in Figures 6 and 7 are consistent with findings by other researchers. A 2006 CBO study concluded that the Army's Critical Skills Retention Bonus program, which offered bonuses as high as \$150,000 for

special-forces occupations and some other special skills, was not sufficient to resolve shortages in those occupations. However, the study identified some occupations in which the Army's Selected Reenlistment Bonus program did appear to offset competition from the private sector.⁵⁷

Another 2006 study, conducted by the Defense Advisory Committee on Military Compensation, concluded that special pays are overly specialized and inflexible and do not adequately motivate productivity or performance. The committee recommended consolidating the more than 60 different kinds of special pays into a few broader pools and using them to make special pays and bonuses a larger percentage of total compensation. According to the committee, those changes would improve DoD's ability to target compensation toward the most critical recruit-

57. Congressional Budget Office, *Recruiting, Retention, and Future Levels of Military Personnel* (October 2006), pp. 22–25.

ing, retention, and other staffing problems without increasing the overall compensation budget.⁵⁸

Nevertheless, the military services are sometimes reluctant to vary pay substantially. Some military officials argue that having a total compensation package that varies by occupation rather than by rank could erode good order and discipline.

Effects of Cash and Noncash Compensation on Recruiting and Retention

It is difficult to quantify how the mix of cash and non-cash compensation affects DoD's ability to attract and retain the force it needs. Many researchers have examined the role of cash compensation—particularly enlistment and reenlistment bonuses—on recruiting and retention. For example, a recent CBO study concluded that the number of recruiters and the amount of advertising were more important than enlistment bonuses or education benefits in attracting new recruits.⁵⁹ Based on a review of other studies, CBO estimated that a 10 percent rise in the number of recruiters would boost enlistments by between 4 percent and 6 percent, whereas a 10 percent rise in cash enlistment bonuses or noncash education benefits would increase enlistments by no more than 1 percent.

Focusing on retention, other researchers have concluded that cash reenlistment bonuses have a positive effect on retaining people after their first or second term of service (generally after four or eight years). But those researchers argue that estimates of how average retention changes in response to changes in cash pay (known as pay elasticity) must be applied cautiously when formulating policy.⁶⁰

In the case of noncash compensation, the effect on recruiting and retention will depend on how individual members value that compensation. Some deferred benefits—such as most veterans' benefits—are available as soon as someone leaves military service. About two-thirds

of new recruits complete their first term of service (generally about four years' long). Of those, about half leave the military at that point. Many of them plan to use some of their veterans' benefits: For example, about 95 percent of first-term enlisted personnel contribute money toward Montgomery G.I. Bill benefits to pay for a college education. Other benefits—such as pensions and health care for retirees and their families—accrue to the roughly 15 percent of enlisted members who serve for at least 20 years. Potential recruits and experienced personnel deciding whether to join or stay in the service may compare military and civilian cash pay and greatly discount the full value of the military's deferred benefits.

For example, the median enlisted member is a single, 22-year-old male in the E-4 pay grade. There is some evidence that the rate at which military personnel discount the value of future benefits is quite high—a recent study estimated it at 18 percent to 20 percent.⁶¹ A new enlistee who stays in the service until retirement and chooses the more generous high-three retirement payments can expect to receive more than \$2.6 million between 2026 and 2065 (if he or she lives to age 77).⁶² But that \$2.6 million may be worth only \$5,900 to \$9,200 to that individual today, assuming a personal discount rate between 18 percent and 20 percent. (See Box 3 for a discussion of personal discount rates.)

In addition, the probability of reaching military retirement is small. Only 17 percent of the people who entered

58. Defense Advisory Committee on Military Compensation, *The Military Compensation System: Completing the Transition to an All-Volunteer Force* (April 2006), pp. 66–71.

59. Congressional Budget Office, *Recruiting, Retention, and Future Levels of Military Personnel*.

60. For a review of the literature and a discussion of the empirical shortcomings of pay elasticities, see Matthew S. Goldberg, "A Survey of Enlisted Retention: Models and Findings," in Department of Defense, *Report of the 9th Quadrennial Review of Military Compensation*, vol. 3, chapter 2.

61. See John T. Warner and Saul Pleeter, "The Personal Discount Rate: Evidence from Military Downsizing Programs," *American Economic Review*, vol. 91, no. 1 (2001), pp. 33–53. Older personnel might be expected to have lower discount rates, but Warner and Pleeter estimated that almost 75 percent of senior enlisted personnel with 15 years of service had similarly high discount rates. In 2006, the Defense Advisory Committee on Military Compensation used another set of military discount rates (based on a 1976 study of civilians), which averaged 20 percent for enlisted personnel with 5 to 8 years of service and 16 percent for those with 15 to 19 years of service. Many members with 15 years of service are still relatively young—most likely, between ages 33 and 35.

62. The high-three formula offers 20-year retirees an immediate monthly payment equal to 50 percent of the average of their 36 highest months of basic pay. The alternative formula, known as REDUX, offers only 40 percent of high-three basic pay but supplements it with a \$30,000 career status bonus, which is paid in a lump sum at the 15th year of service. Also, the high-three annuity is fully indexed to the consumer price index, whereas the REDUX annuity generally lags that index by 1 percentage point per year.

Box 3.**Personal Discount Rates**

A sum of money received in the future is worth less than the same sum received today. To estimate the value of a future sum in terms of today's money, analysts use a process called discounting. The general formula for the present value of \$1 to be received N years from now when the discount rate is d is $1/(1+d)^N$. The higher the discount rate, or the greater the number of years in the future, the lower the present value of the sum. In many financial calculations, d is assumed to be the interest rate that the money could earn if it were received today and invested. One discount rate commonly used in estimating the federal government's liabilities is the interest rate on 30-year government bonds, which has been about 5 percent (in nominal terms) in the past few years.

Prior Studies of Civilian Discount Rates

Many researchers have tried to measure the discount rates that individuals use (often implicitly) in making economic decisions.¹ Such personal discount rates may be substantially higher than Treasury rates, money market rates, or other measures of market interest rates. Most of those studies surveyed civilians

(frequently college students) about either hypothetical choices or choices involving small amounts of money. Some studies instead inferred discount rates from consumer purchases.

Those various studies generally find that the size and payment structure of any economic decision affect how people discount future amounts. David Fetherstonhaugh and Lee Ross, for example, surveyed adults over age 40 about retirement choices and found that whether people perceive the size of their monthly retirement payment relative to the payment they would have received had they retired at a different age as a loss from early retirement or a gain from delayed retirement affects their choice (suggesting differing discount rates even if the loss and gain are

1. See, for example, Richard H. Thaler, "Some Empirical Evidence on Dynamic Inconsistency," in Thaler, ed., *Quasi-Rational Economics* (New York: Russell Sage Foundation, 1991), pp. 127–133; and David Fetherstonhaugh and Lee Ross, "Framing Effects and Income Flow Preferences in Decisions about Social Security," in Henry J. Aaron, ed., *Behavioral Dimensions of Retirement Economics* (Washington, D.C.: Brookings Institution Press, 1999), pp. 187–209.

the armed forces in 2005 (officers and enlisted personnel combined) are expected to receive nondisability retirement benefits.⁶³ New enlistees with an 18 percent discount rate might value their eventual retirement package at \$9,200, but if they believe they have only a 17 percent chance of reaching retirement, they may value that package at closer to \$1,600.

The relatively low value that young people place on deferred compensation—combined with the relatively low probability that a new recruit will stay for 20 years—suggests that the recruiting and retention value of deferred benefits is lower than that of current cash compensation. Yet the cost to the government is significant. DoD will pay \$4,800 of a new recruit's cash compensa-

tion to the Military Retirement Fund (to cover future retirement benefits) in his or her first year of service alone.

The promise of retirement pay and health benefits does encourage personnel who have already served for at least 10 years to remain for the full 20 (and then leave soon after). Some researchers argue that DoD is reluctant to involuntarily separate those mid-careerists.⁶⁴ The researchers say that beyond a certain pay grade or year of service, military personnel are treated as though they have an implicit contract to stay for 20 years. Nevertheless, the high discount rates observed even among older service members suggest that many would prefer current cash

63. Department of Defense, *Valuation of the Military Retirement System*, p. 12.

64. Beth J. Asch and John T. Warner, *A Policy Analysis of Alternative Military Retirement Systems* (Santa Monica, Calif.: RAND, 1994), p. 6.

Box 3.**Continued**

actuarially equivalent). They also found that people value lump-sum payments more highly than streams of payments such as annuities (implicitly discounting lump sums at lower rates than annuities).

Several studies conclude that discount rates vary with income and other personal characteristics, such as education, age, and ethnicity. Many of those studies also find that people discount future amounts differently depending on how long they will wait for the reward (or penalty). They appear to apply higher discount rates to amounts with a short delay than to amounts received farther in the future. In a study by Richard Thaler, for example, college students were asked hypothetically how much money they would require to wait to receive a lottery prize in the future instead of receiving it immediately. The implicit discount rates calculated from their responses suggest that people will discount the choice between \$100 today and \$100 a year from today more highly than the choice between \$100 in 20 years and \$100 in 21 years. Thaler's findings also suggest that people do not discount all future values at the same rate but rather tend to discount large sums at lower rates than smaller sums.

Discount Rates for Military Personnel

In its discussion of the choice between current and deferred military benefits, this analysis relies on estimates of discount rates from a study conducted by John Warner and Saul Pleeter during the military drawdown of the early 1990s.² At that time, to induce large numbers of personnel to leave the military before a full 20-year career, the Department of Defense offered eligible personnel the choice between a lump-sum separation payment or an annuity. The sums involved were relatively large—about \$25,000 in lump-sum payment for an enlisted member. That study confirmed some of the findings of the earlier studies discussed above, but its results differed in one important way: It found no evidence that the time delay affected personal discount rates. Although that study provides useful estimates of personal discount rates for the choice between lump-sum payments and annuities, policies that offered different choices (such as between different types of annuities) might cause potential recipients to behave differently than Warner and Pleeter's estimates would suggest.

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2. John T. Warner and Saul Pleeter, "The Personal Discount Rate: Evidence from Military Downsizing Programs," *American Economic Review*, vol. 91, no. 1 (2001).

compensation over remaining in the military and receiving deferred retirement pay and benefits.

Even some elements of current noncash compensation may not be valued at their full cost by military personnel. Single personnel are less likely to value family-support benefits than personnel with families are. Moreover, the two-thirds of active-duty families who do not live on military bases, plus the families of reservists, may not value on-base benefits highly.

Finally, in decisions related to compensation, service members may focus only on their take-home pay. As they assess their compensation package, they might not consider the value of taxes they do not have to pay or medical copayments they are not charged.

In sum, it is often easier for potential recruits, current personnel deciding whether to reenlist, and senior policymakers to recognize the value of cash compensation than the value of noncash and deferred benefits. Therefore, some analysts believe that a compensation package more heavily weighted toward cash would enable DoD to maintain a larger and more capable force for the same total cost as the current force.

Options to Increase the Visibility and Efficiency of Military Compensation

Policymakers, individual service members, and taxpayers may find it difficult to assess the adequacy of military pay because that compensation includes many components spread among different agencies and appropriations.

Comparing noncash and deferred benefits between the military and civilian sectors is also complicated. Lawmakers, DoD, or the Office of Management and Budget could take various steps that would make it easier to compare military and civilian compensation. For example, they could integrate the different components of military pay in several alternative ways. In addition, they could shift the mix of cash and noncash compensation for military personnel to make that package more comparable with civilian packages.

Integrating the Components of Total Compensation

One approach that would increase the visibility of the total military compensation package would be to consolidate personnel costs into a single appropriation.⁶⁵ Greater visibility would allow senior leaders in DoD and the Congress to assess more readily the total cost of military personnel. That change would also improve the incentives for DoD managers to use military personnel efficiently. Because the various elements of compensation cut across different agencies and appropriations, however, implementing that change would be difficult.

A second option would be to combine only the three largest elements of cash compensation—basic pay and the allowances for food and housing. All of those elements are funded through each service’s military personnel appropriations account. If they were combined, policymakers could match the annual increases in all three components—rather than just the basic-pay raise—to the projected change in the civilian employment cost index. For example, if the basic allowance for housing (BAH) and the basic allowance for subsistence (BAS) were expected to increase by 4.5 percent in 2008 (the same rate at which they grew in 2006), the basic-pay raise could be lower than the expected 3.3 percent annual increase in the ECI but still leave military pay raises comparable with civilian raises. However, that approach would yield budgetary savings only when housing and subsistence costs were expected to grow faster than the ECI (thus allowing for a lower basic-pay raise to meet the civilian benchmark). When BAH and BAS were expected to grow relatively slowly, the basic-pay raise would need to exceed the change in the ECI to maintain overall comparability.

65. That option is discussed in Congressional Budget Office, *Budget Options* (February 2007), Option 050-11.

A rationale for that option is that it would allow for more-accurate benchmarking by letting policymakers evaluate three determinants of cash compensation together. Also, to the extent that rising food and housing prices cause wages to increase (thereby boosting the ECI), a policy that adjusted the basic-pay raise, BAS, and BAH together would avoid compensating service members doubly. However, if higher allowances resulted in lower basic-pay raises, members would earn lower retirement and other benefits that are tied to the level of basic pay.

A third way to help make military compensation more easily comparable to civilian compensation is to eliminate the “family premium” for service members with dependents. Policymakers could eliminate that premium by raising BAH for single personnel to the “with dependents” rate. (Raising single members to that rate would cost about \$400 million in 2008 and about \$1.1 billion annually by 2012, CBO estimates.)⁶⁶

According to its proponents, that option would better link military compensation to job performance. In addition, the higher pay for people without dependents would increase recruiting and retention of those personnel. First-term enlisted members would see the largest increase in pay. Improved recruiting and retention of those members could allow for savings in other recruiting resources (such as advertising or recruiters) and in enlistment or reenlistment bonuses. In addition, to the extent that eliminating the pay premium based on dependents removed the incentive to marry younger, the costs of that change might be offset by savings in family-support programs and a reduced desire for noncash family-related benefits. Those potential savings are not easily quantified, however.

Increasing Cash Relative to Noncash Compensation

In addition to the changes described above, policymakers could opt to gradually increase DoD’s reliance on cash compensation in various ways. For example, they could introduce a medical “cafeteria plan” for the health benefits of active-duty personnel’s family members, or they could consolidate military commissaries and exchanges to

66. Those figures assume that members without dependents are assigned in the same locations (by pay grade) as members with dependents, so the geographic variation in BAH affects single personnel and families equally, on average. The estimate also assumes the same proportion of single and married members after the change as beforehand.

eliminate duplicative functions and offer tax-free grocery allowances of about \$500 per year.⁶⁷ (That latter change could save about \$700 million a year, CBO estimates.)

Another option to substitute cash for noncash compensation would be to close all of the U.S.-based schools run by the Domestic Dependent Elementary and Secondary Schools (DDESS) system and increase the use of local public or private schools instead. The DDESS system operates schools on several U.S. military bases to educate dependents of personnel living there.⁶⁸ Closing those schools would allow DoD to pay affected families a tuition allowance of about \$8,600 per student, CBO estimates, and still save DoD about \$80 million in 2008. The financial impact on the federal government as a whole would be less than that, however, because the Department of Education would have to spend more on Impact Aid, which it pays to local school districts that enroll children living on military bases. If 80 percent of affected students chose to attend public schools, for example, local school districts would receive about \$80 million in Impact Aid and other federal funding. In that

67. See Congressional Budget Office, *Budget Options*, Options 050-17 and 050-20.

68. DoD also operates a separate school system for military dependents living overseas, but those schools would not be affected by this option.

case, the overall savings to the federal government would be zero in 2008 and about \$20 million per year by 2012.⁶⁹

Supporters of boosting cash benefits relative to noncash and deferred benefits argue that cash can be more efficient. Not only is its value more easily recognized by potential recruits, current service members, and policymakers, but cash also gives personnel more choices in how to spend their pay. In addition, proponents argue that the shift to a more expeditionary military (in which personnel serve shorter overseas deployments and are not accompanied by their families) makes an extensive non-cash system less effective than one weighted more heavily toward cash compensation.

Critics of shifting the mix of compensation toward more cash argue that extensive noncash benefits better compensate personnel for unique aspects of military life. Such benefits can promote military readiness, they argue, or improve the quality of life for service members and families by ensuring a certain level of goods and services, even in isolated places where private-sector markets are limited.

69. If federal funds did not fully cover the cost of additional students in the public schools, state and local governments would have to absorb the difference.

Total Compensation for the Median Enlisted Member

Using a different approach from the studies of military compensation summarized in Table 1 on page 5, the Congressional Budget Office (CBO) also estimated compensation for the typical enlisted service member in 2006, including only benefits that the person was likely to use.¹

The median enlisted member has served in the military for four years. Among people at that level of experience, the median pay grade is E-4, and the median age is 22. About 52 percent of those E-4s have no dependents, and 48 percent of them do. Because the probability of having dependents is so close to 50/50, CBO estimated compensation for an average member with or without a family.

In 2006, a 22-year-old E-4 with no dependents received a total compensation package worth about \$70,450. Of that amount, 54 percent was in cash—basic pay, allowances for food and housing, and the tax advantage that military personnel receive because those allowances are not subject to federal income taxes (see Table A-1). The

rest of that member's compensation took the form of noncash or deferred benefits. About 8 percent of his or her total compensation consisted of subsidized goods and services that could be used immediately, such as medical care or groceries purchased at commissaries. The other 38 percent of total compensation was the accrued cost of retirement annuities and other deferred benefits that the member may receive after he or she leaves active duty, including health care for retirees and veterans' benefits. (About 40 percent of that deferred noncash compensation goes to veterans who leave the military without serving for 20 years, and about 60 percent goes to veterans who reach that length of service or otherwise become eligible for retirement benefits.)

Personnel with families earn greater compensation than single members. A married E-4 with two children earned about \$85,800 in 2006, of which nearly half was cash compensation and half noncash and deferred compensation. Current noncash benefits made up a much larger share of total compensation for that member than for his or her single counterpart: 21 percent versus 8 percent. Those benefits mainly included health care for the member and his or her family, subsidized child care (assuming that the member's spouse is employed), and subsidized groceries at the commissary. The other 30 percent was deferred compensation.

1. In contrast, a 2004 issue brief by CBO presented estimates of total cash and noncash compensation per active-duty member that included the value of certain benefits (such as on-base housing) not used by most personnel. See Congressional Budget Office, *Military Compensation: Balancing Cash and Noncash Benefits* (January 16, 2004).

Table A-1.

Breakdown of Compensation for the Median Enlisted Member With and Without a Family, 2006

	Percentage of Total Compensation	
	Average Single Enlisted Member (A 22-year-old E-4 with four years of service and no dependents)	Average Married Enlisted Member (A 22-year-old E-4 with four years of service, a working spouse, and two children)
Current Cash Compensation		
Basic pay	33	28
Basic allowances for housing and subsistence	18	18
Tax advantage ^a	3	3
Subtotal, current cash	54	49
Current Noncash Benefits		
Military health care	4	9
Other noncash benefits ^b	4	12
Subtotal, current noncash	8	21
Deferred Compensation ^c		
Veterans' benefits	16	13
Retiree health care	12	9
Retirement pay	10	8
Subtotal, deferred	38	30
Total	100	100
Memorandum:		
Total Compensation in 2006 Dollars ^d	70,450	85,800

Source: Congressional Budget Office.

- The advantage that occurs because cash allowances for housing and subsistence (food) are not taxed.
- These benefits include the Department of Defense's (DoD's) contributions to Social Security, Medicare's Hospital Insurance program fund, and the Unemployment Compensation for Ex-Servicemen program, as well as on-base services such as subsidized grocery stores and child care.
- Veterans' benefits (including health care, education programs, and housing loans) are administered by the Department of Veterans Affairs and generally are available to former military members who have successfully completed their service commitment, which could be four years or less. Retirement pensions and DoD-administered health care are available to former personnel who generally have served 20 years or more. The figures here represent annual accrued costs per member. However, because veterans' benefits are not funded on an accrual basis, these estimates cannot be compared with amounts in federal budget documents for fiscal year 2006.
- These numbers differ from the compensation shown for an E-4 in Table 2 because the member in this table has four years of service (the median for the enlisted force as a whole), whereas the E-4 in Table 2 has three years of service (the average for that pay grade).

How Pay Changes with Deployment

Military personnel who were deployed in 2006 were eligible to receive various special pays, which are listed below.¹ Generally, such pays are earned on a month-to-month basis: A service member who spends any part of a month—even less than a day—in a designated area is entitled to pay for that month.

- **Assignment Incentive Pay.** All of the military services use this pay (which is capped at \$3,000 per month) to compensate for unusual assignments. Members with certain skills who had been deployed for more than 12 months in Iraq or Afghanistan last year and who agreed to extend their tours received as much as \$1,000 per month in assignment incentive pay, depending on their skills and the length of their extension.
- **Imminent-Danger Pay or Hostile-Fire Pay.** Service members could receive \$225 per month in imminent-danger pay in 2006 by being in an area that was officially designated as dangerous. Alternatively, members who unexpectedly came under hostile fire in a foreign country could receive hostile-fire pay (also \$225 per month). The same person could not receive both types of pay, however.
- **Family-Separation Allowance.** This allowance, intended to compensate members with dependents who serve away from their families for at least 30 days in a row, was \$250 per month in 2006.
- **Hardship-Duty Pay—Location.** Enlisted personnel or officers serving for at least 30 days in an arduous area qualify for this pay, which can vary from \$50 to \$150 per month depending on the area. Service in Iraq or Afghanistan qualified for \$100 per month last year (in addition to \$225 in imminent-danger pay, for a total of \$325 per month). Service members whose tours in the Iraq theater were involuntarily extended beyond 12 months received an additional \$800 a month in assignment incentive pay and \$200 a month in hardship-duty pay.
- **Hardship-Duty Pay—Mission.** This type of special pay is earned by personnel who perform crash-site investigations or who recover the remains of U.S. service members in remote foreign locations. In 2006, it was \$150 per month. (Individuals may be eligible to earn both location-based and mission-based hardship-duty pay at the same time.)
- **Overseas Tour Extension.** Enlisted members who extended their overseas tour for at least 12 months in 2006 could choose from additional monthly pay (\$80 per month), a lump-sum cash payment (up to \$2,000, though not offered by the Navy), or extra rest-and-recuperation leave.
- **Savings Deposit Program.** Personnel who were deployed to the Iraq or Afghanistan theaters in 2006 could participate in this program, which allowed them to receive 10 percent interest on deposits of up to \$10,000 earned in those theaters. The deposit amount and accrued interest was generally returned to a member within 90 days after he or she left the region.

1. The information in this appendix comes from the statement of David S.C. Chu, Under Secretary of Defense for Personnel and Readiness, before the Military Personnel Subcommittee of the House Armed Services Committee, April 6, 2006; Military Times Media Group, “2006 Handbook for Military Life,” which appeared as a supplement in *Air Force Times*, April 10, 2006; and Lawrence Kapp, *Operations Noble Eagle, Enduring Freedom, and Iraqi Freedom: Questions and Answers About U.S. Military Personnel, Compensation, and Force Structure*, CRS Report for Congress RL 31334 (Congressional Research Service, January 27, 2006).

- **Career Sea Pay.** Designed to compensate for the challenges of sea duty, this pay may be earned by any service member, although it is primarily paid to people in the Navy. Last year, sea pay for enlisted personnel ranged from \$50 to \$646 a month. Officers are not eligible for sea pay until they have spent a total of at least three years (which need not be consecutive) on shipboard assignments.
- **Sea-Pay Premium.** Enlisted sailors in grades E-4 and below who had been on sea duty for more than three consecutive years earned an extra \$100 per month in addition to their career sea pay in 2006. (That premium amount is built into career sea pay for people in higher enlisted pay grades.) Officers could also receive the \$100 per month premium any time they served more than three consecutive years at sea.
- **Combat Zone Tax Benefits.** Enlisted members and warrant officers serving in a designated combat zone in 2006 could exclude all their income from federal income tax. That exclusion included basic pay and some types of special pays, such as assignment incentive pay, imminent-danger pay, hardship-duty pay, and sea pay. Commissioned officers could exclude part of their income, but the exclusion is capped at the highest enlisted pay less any imminent-danger or hostile-fire pay received.
- **Submarine Duty.** Enlisted members and officers who serve on board submarines receive this pay in addition to sea pay. Last year, submarine pay ranged from \$75 to \$425 per month for enlisted personnel (depending on pay grade and years of service), from \$425 to \$835 a month for officers, and from \$375 to \$425 per month for warrant officers.

Types of Occupation- or Skills-Based Compensation

Besides regular military compensation and the various kinds of deployment-related special pays described in Appendix B, service members can receive compensation for having a particular occupation or special skill. (The amounts given below are for 2006.)¹

Selective Reenlistment Bonus

To retain some highly skilled, experienced personnel, the military services pay bonuses of up to \$90,000 (in some cases, as much as \$150,000). The amount of those bonuses is based on length of reenlistment, years of service, and particular skills. The bonus can be paid as a lump sum or in installments.

Service members who were part of the special-operations forces last year could receive a retention incentive package that included a critical-skills retention bonus, special-duty assignment pay, assignment incentive pay, and an accession bonus for new warrant officers with critical skills. For example, highly skilled senior noncommissioned officers (those in pay grades E-7 through E-9) who were nearing retirement or were eligible to retire could receive a critical-skills bonus of \$150,000 if they agreed to serve for another six years.²

Hazardous-Duty/Parachute Pay

Officers or enlisted personnel who serve in especially hazardous jobs, such as those dealing with toxic chemicals, can receive an extra \$150 per month. Members who

undertake high-altitude, low-opening parachute jumps receive \$225 per month.

Flight Pay

Four types of flight pay are available in the military:

- Aviation career incentive pay can be awarded to officers and warrant officers with at least six years of active aviation service. The pay ranges from \$125 to \$840 per month depending on the length of aviation service.
- Aviation continuation pay is designed to encourage retention among aviators in specific year groups or at critical departure points. It is offered to officers who remain on active duty beyond their initial service commitment. The additional pay totals \$25,000 per year in the Air Force and the Navy (and for Army special-operations pilots), \$18,000 in the Marine Corps, and \$12,000 in the Army.
- Career enlisted flight pay is available to enlisted crew members in the Air Force and the Navy. It ranges from \$150 to \$400 per month depending on years of aviation experience.
- Hazardous-duty incentive pay for flying is available to enlisted personnel in the Army, Marine Corps, and Coast Guard; it ranges from \$150 to \$240 a month depending on pay grade. In addition, nonpilots (whether officer or enlisted) who serve aboard military aircraft are eligible for this pay if they do not already receive career incentive pay or flight pay. Air weapons controllers on Airborne Warning and Control System (AWACS) planes also qualify for \$150 to \$350 per month according to their rank and years of service.

1. The information in this appendix comes mainly from Military Times Media Group, "2006 Handbook for Military Life," which appeared as a supplement in *Air Force Times*, April 10, 2006; and Department of Defense, Office of the Secretary of Defense, *Military Compensation Background Papers*, 6th ed. (April 2005).

2. Congressional Budget Office, *Recruiting, Retention, and Future Levels of Military Personnel* (October 2006), p. 25.

Foreign Language Proficiency Pay

Active-duty service members who are proficient in one or more foreign languages can receive an additional \$200 to \$1,000 per month depending on the language and their degree of proficiency. The highest pay goes to personnel who are proficient in Arabic, Pashtu, Persian-Afghan (Dari), and Chinese.

Diving Pay

Military divers receive up to \$340 per month in additional pay for their skill.

Nuclear Duty Pay

Naval officers who join a nuclear-qualified field are eligible for a one-time accession bonus of \$10,000 to \$20,000. Those who remain in the field are eligible for continuation bonuses.

Medical Pay

Various special pays are available to medical personnel in the armed forces. Most are designed to make military pay comparable to civilian pay for health professionals.

- Pay for retaining board certification in a medical field ranges from \$2,500 to \$6,000 per year.
- Medical and dental officers in critical specialties who have at least eight years of creditable service or have no remaining active-duty service commitment for medical education and training can receive a bonus if they agree to stay on active duty for another two to four years. The bonus amount ranges from \$6,000 annually for a two-year extension to \$50,000 annually for a four-year extension.
- Nurse anesthetists also receive special incentive pay by agreeing to remain on active duty. That pay varies from \$15,000 per year for a one-year pledge to \$40,000 per year for a four-year extension.
- Optometrists and pharmacy officers receive skill-based special pay as well.